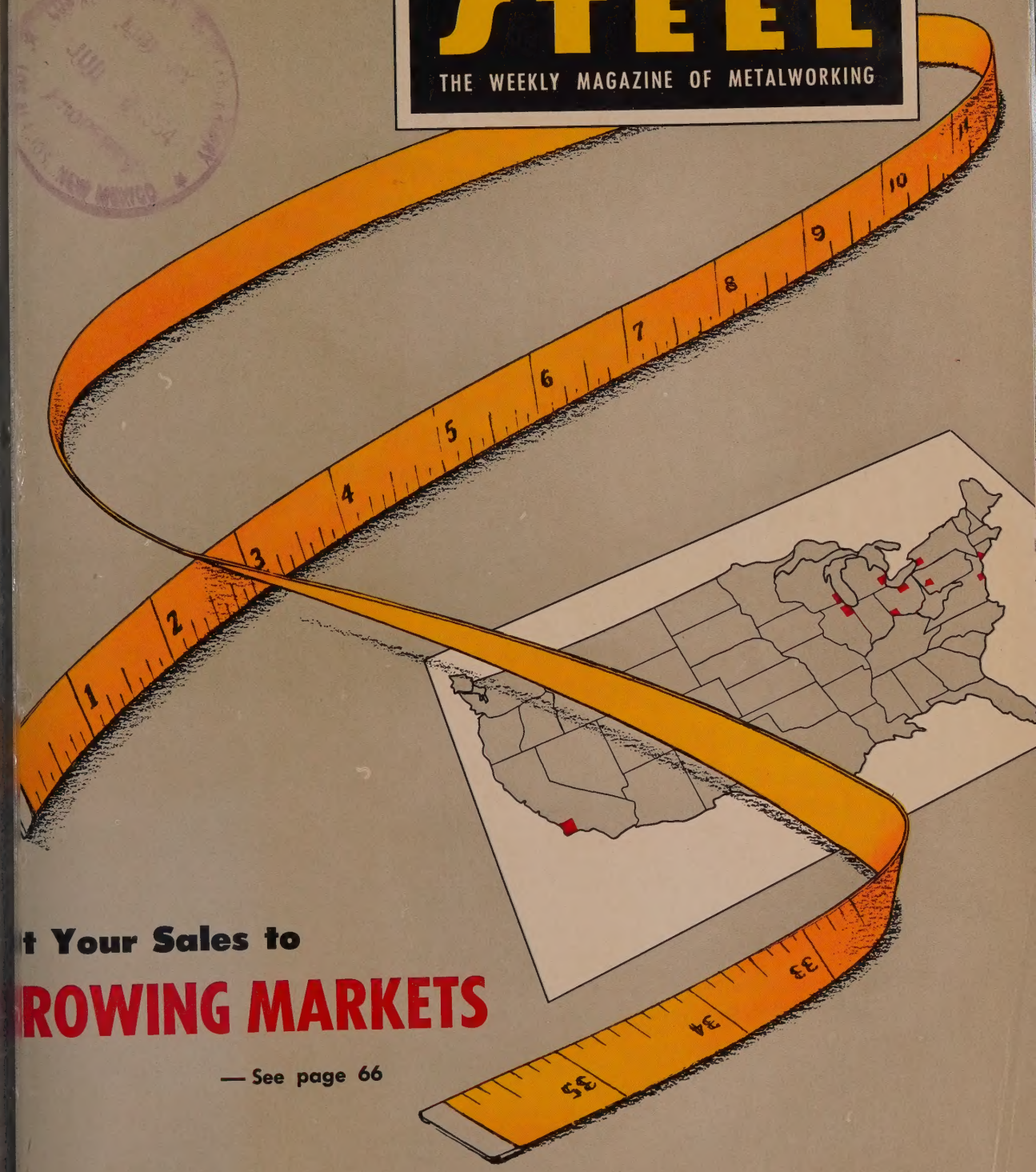
JUNE 7, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



t Your Sales to

ROWING MARKETS

— See page 66

CAPITAL EQUIPMENT REPLACEMENT
$26.7 Billion Annual Market by 1975? p. 63

INERT GAS WELDING COSTS LESS
Water Tanks Fabricated Quickly, p. 106

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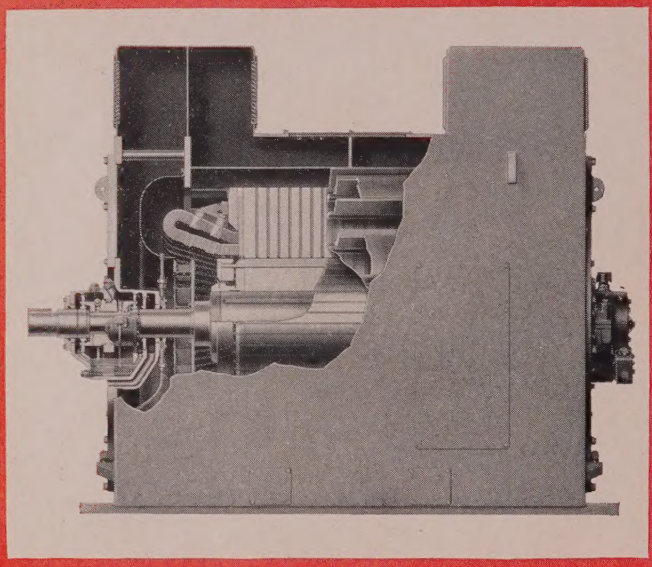
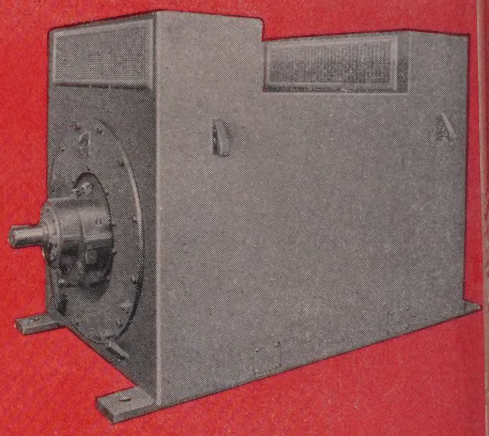
Redesigned

INSIDE AND OUT





ALLIS-CHALMERS
Large 2-Pole Cage
MOTORS

New features improve 2-pole motors long known for reliability and low maintenance.

New ventilating arrangement features top air intake and discharge *plus* spiral stator core ventilation. Top intakes (available with filters) keep motor clean and make motor room cleaning easy; top discharge adds to personnel comfort. Spiral ventilation — used in turbine generators — assures even internal cooling . . . combines with centrifugal fans and baffled air passages to reduce noise.

Improved bearing design simplifies maintenance, prevents oil leakage. Capsule-type housings — proved in use on other designs — permit inspection of windings without exposing bearings. Oil leakage is prevented by a combination of features, including orifice-metered oil flow, weirs to maintain correct oil level, labyrinth seals, breathers, and annular pressure chambers with atmospheric relief.

Clean-cut appearance is gained by providing internal space for stator and auxiliary leads, etc.

Features that helped build the Allis-Chalmers 2-pole motor reputation for reliability are retained in the new design. These include proven stator coil design, ample stator coil end bracing, thermally and mechanically stable cage assembly, separate balancing rings, and oxygen-free dew-drop cage bars.

This design available in ratings 900 hp and larger. Ask your A-C representative for Bulletin 05R8123. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4349

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

"Holding Power" is an interesting new industrial film which tells the complete story of fasteners. It describes common, everyday fastener items, such as bolts, nuts, rivets, track bolts and spikes, and shows how important they are to our modern way of life. The film also includes roof bolts, high-strength bolts, oil-well sucker rods, and a wide range of ingeniously designed special bolts.

"Holding Power" is in color, with sound. It is on 16 mm film, and runs about 25 minutes.

The film is intended not only for those closely associated with the fastener field, but also for general-type audiences. There is no charge for this educational picture, except for return postage. If you would like to use a print, write fully to Room 1036, Publications Department, Bethlehem Steel Company, Bethlehem, Pa., preferably well in advance of your showing date.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Only Yoder-TOCCO* Makes Welded Tubing at 250' per minute in Regular Production

Yoder—TOCCO mills, using the patented TOCCO Process for welding ferrous pipe and tubing are actually producing pipe at speeds of 150 to 250 feet per minute. This rate is almost twice as fast as any other cold forming pipe mill in production anywhere in the world. *Check these advantages:*

- ✓ A production speed of 250' per min.
- ✓ lower cost because of increased production and lower maintenance.
- ✓ a smooth, continuous weld—no stitching.
- ✓ an extra strong weld—because it's 100% uniform and continuous.
- ✓ no scaling of ferrous tubing.
- ✓ controlled weld flash—either I. D. or O. D.—or in some cases none.

Whether it's welding, heat-treating, brazing, melting or heating for forging operations, it pays you to investigate TOCCO Induction Heating as a means to better products, faster and at lower cost.

THE OHIO CRANKSHAFT COMPANY

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-6, Cleveland 1, Ohio

Please send copy of "TOCCO Induction Heating"

Name_____

Position_____

Company_____

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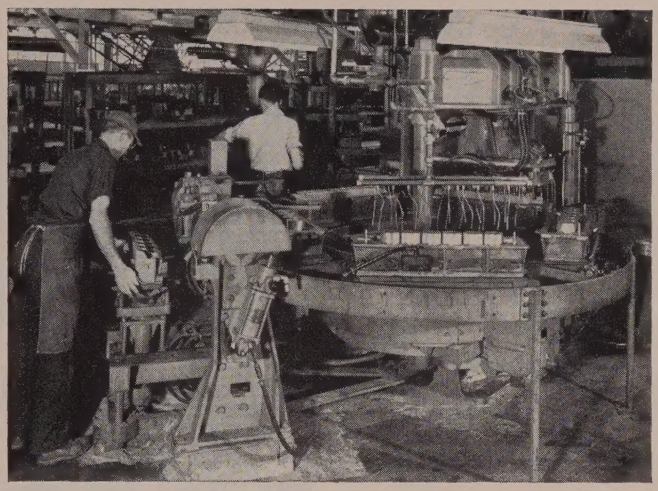
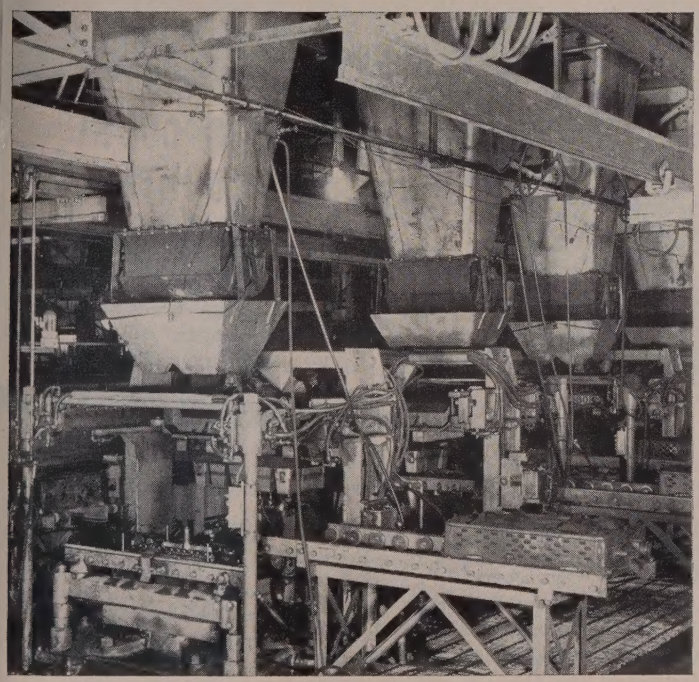
City_____ Zone____ State_____



FAST, EFFICIENT PRODUCTION
Here, Osborn Roto-Core Units produce water jacket and other high-quality cores at rates exceeding 300 blown core boxes hourly.

OSBORN AUTOMATION

...it's cutting foundry costs everywhere



TEN large Osborn Jolt Squeeze Strippers meet the demand for high-quality cylinder head molds in large volume. Each is capable of more than 100 operations hourly.

Equipped with semi-automatic controls, these machines have a power operated squeeze head and side roll-on and roll-off . . . requiring less operator effort and training.

Osborn automation has a proven record for cutting costs on both large and small work . . . in many different foundries. Benefit now from Osborn's experience in mechanized production of molds and cores. An Osborn factory-trained foundry specialist will gladly show you how to increase the efficiency of your operations and improve the quality of your work. Write The Osborn Manufacturing Company, Dept. EE-19, 5401 Hamilton Avenue, Cleveland 14, Ohio.

Another example of Osborn leadership and advanced engineering

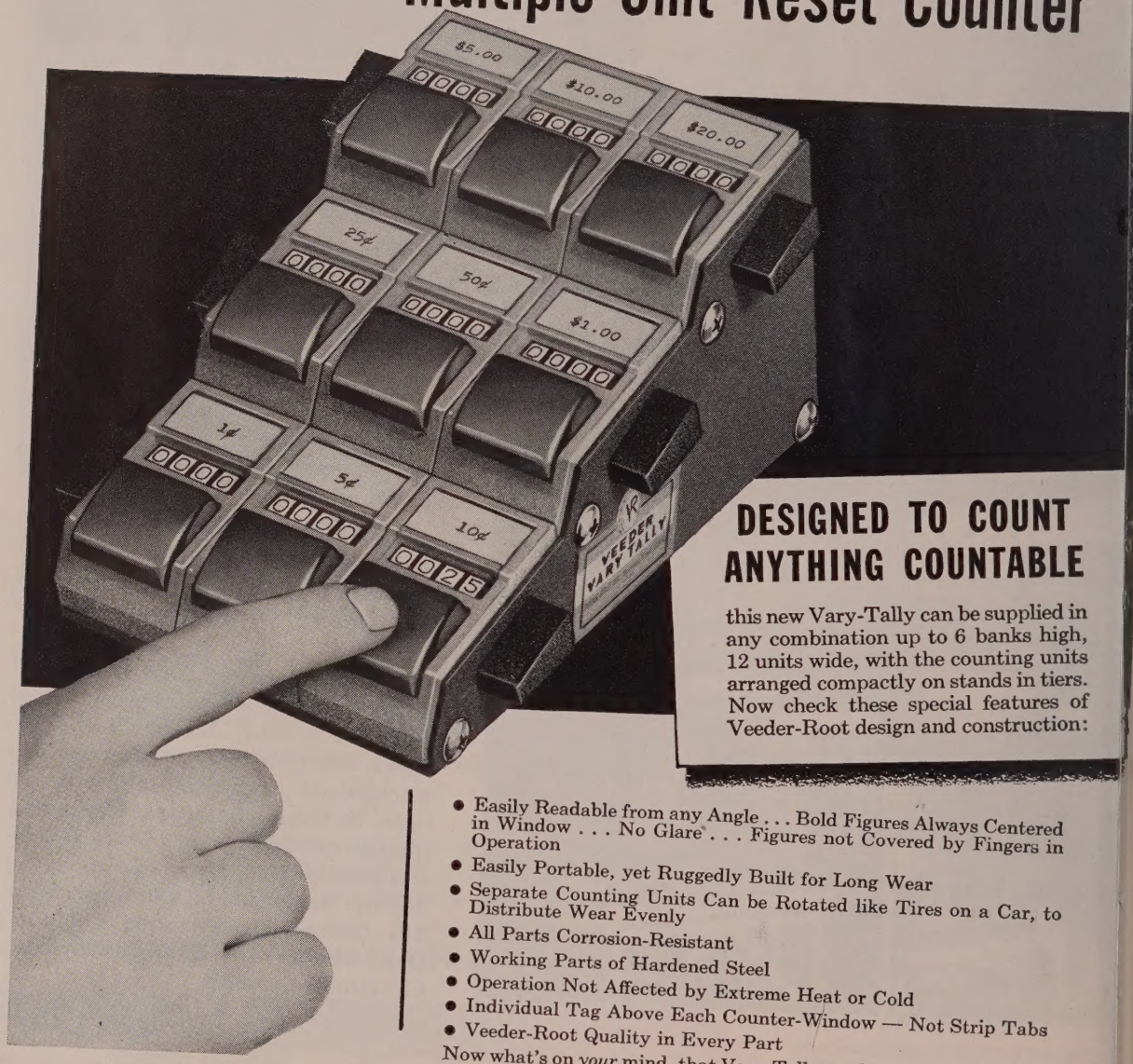
OSBORN

MOLDING MACHINES CORE BLOWERS

New!

VARY-TALLY

Multiple-Unit Reset Counter



DESIGNED TO COUNT ANYTHING COUNTABLE

this new Vary-Tally can be supplied in any combination up to 6 banks high, 12 units wide, with the counting units arranged compactly on stands in tiers. Now check these special features of Veeder-Root design and construction:

- Easily Readable from any Angle . . . Bold Figures Always Centered in Window . . . No Glare . . . Figures not Covered by Fingers in Operation
- Easily Portable, yet Ruggedly Built for Long Wear
- Separate Counting Units Can be Rotated like Tires on a Car, to Distribute Wear Evenly
- All Parts Corrosion-Resistant
- Working Parts of Hardened Steel
- Operation Not Affected by Extreme Heat or Cold
- Individual Tag Above Each Counter-Window — Not Strip Tabs
- Veeder-Root Quality in Every Part

Now what's on *your* mind, that Vary-Tally can help you count? Write for news sheet and prices.

"The Name that Counts"

VEEDER-ROOT INC.

HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C. • Montreal 2, Canada • Dundee, Scotland • Offices and Agents in Principal Cities

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 23 June 7, 1954

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Industry-College Seminars 64

Fit Your Sales to Growing Metalworking Markets 66
Metalworking's growth since 1939 has been tremendous. Here's where your markets are concentrated

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St. Lawrence Seaway 74
Last in a series of three articles showing the effect this gigantic project will have on the nation's economy

Mirrors of Motordom 78

The Business Trend 81

Men of Industry 85

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Tool type, shape and carbide grade are all variables. Grade choice can be based on wear characteristics

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Though material costs are higher, this fabricator has made up the difference in lowered labor costs using inert-gas

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Pushbutton Water Demineralization Accelerates Tinplate Production—One plant's operation described

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SYSTEMS TO YOUR OWN PRESCRIPTION for Vastly Increased Chemical Resistance at Higher Temperatures

What chemicals do you want to resist? At what temperature? You give us your requirements and we'll prescribe for them with the correct, best PLA-TANK formulation to solve *your* particular problem. We vary the formula to meet the need.

It is literally possible for our technical service engineers to prescribe one of a number of vastly improved combinations of PLA-TANK material for liquid contact applications never before considered suitable for ordinary polyester plastics. *These new materials are resistant to temperatures of 200° and over.*

Remember — All Polyesters are not Alike

PLA-TANK achieves these vastly improved resistances by carefully controlled variations in either the resin or fiber or both. Now more than ever *"all polyesters are not alike"* and commonly published studies of polyester performance must not be applied to PLA-TANK special materials.

Intensive research and testing covering thousands of samples have isolated and selected those alkyds which show highest chemical resistance to various specific agents and matched them with the most effective cross links.

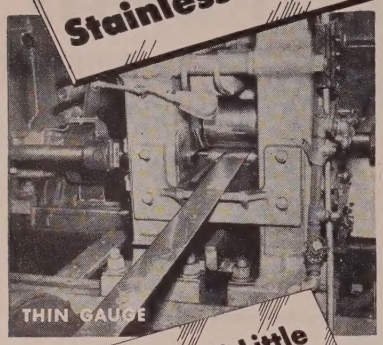
NOW . . . you, in the chemical industry, can "prescribe" new PLA-TANK for your own *specific* needs, knowing your tanks and duct systems will have increased usefulness and longer life. Benefit from continuous research and development with PLA-TANK —*first* name in chemical resistant laminates.

WRITE TODAY — mentioning your requirements, for complete data sheets on new PLA-TANK material.

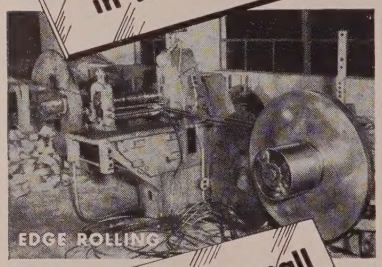
P-19

THE Chemical CORPORATION
56 Waltham Ave., Springfield 9, Mass.

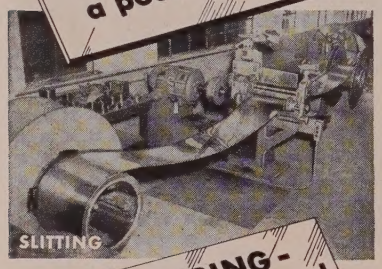
ULBRICH
Stainless Steels



The BIGGEST Little Converting Mill in the Country



Specialists in small orders—a foot or a pound and up



STRIP-TUBING—
Flat Wire-Converted to your exact requirements

Complete Inventory—
Delivery from Stock

Certified ANALYSIS can be given on any Ulbrich material

ULBRICH
Stainless Steels
WALLINGFORD · CONN.
Phone: Wallingford 9-7771

behind the scenes

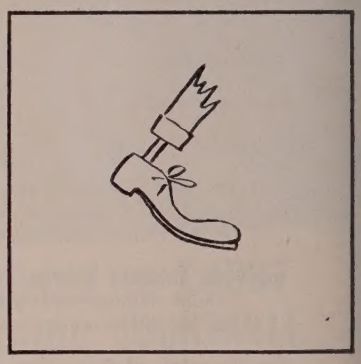
Good Salesmen Make Cents

Peddlers, drummers, hucksters, salesmen . . . call them what you will, we still think they're the greatest invention since the wheel. Fact is, the fraternity of the glib tongue and persuasive personality has had as much to do with the "a la mode" standard of living we enjoy today as any single group of working folks we know.

Just look at some of his accomplishments. The salesman has added to American culture. Think of the many wonderful stories of the traveling salesman-farmer's daughter variety which have become a real part of our folklore. The salesman has added to our educational progress. Look at how many of them have worked their way through college. The salesman has taught us resourcefulness. He is the only personality we know who can simultaneously keep his ear to the ground, his nose to the grindstone, his shoulder to the wheel and his eye to the future—all the while being very careful to keep abreast of the times.

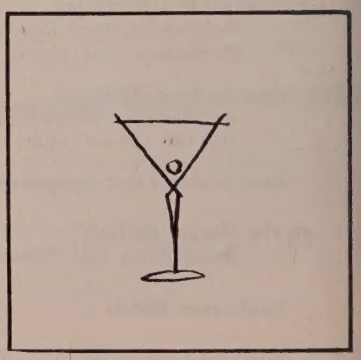
But the salesman has his problems, too. Let us droodle a few of them for you.

This is the illusive dotted line as it looks to the customer. You can see why the salesman has such a difficult time getting his prospect to sign it.



This is the foot the salesman *had* in the door.

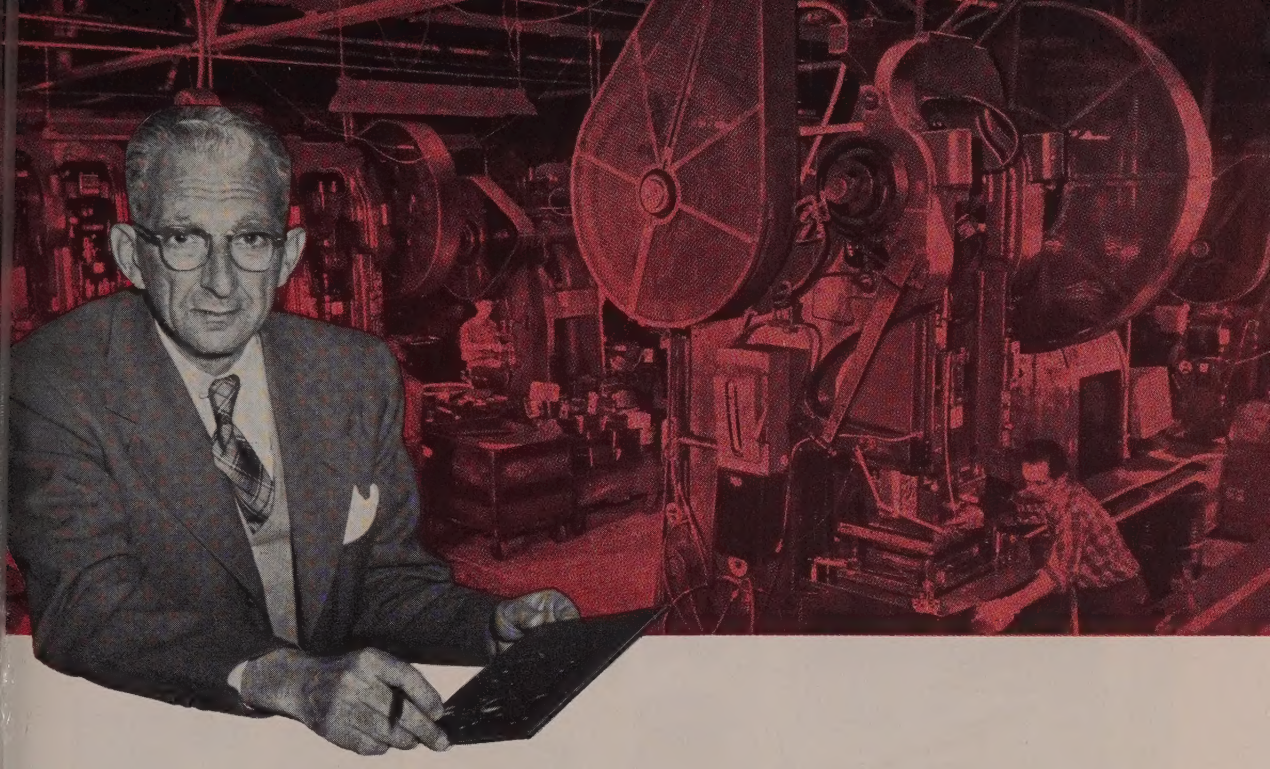
This is you or anyone else who represents a prospective sale as the salesman sees you. The only antidote to this kind of poison is a liberal expense account.



One of the tools of the salesman's trade. Can you imagine what all those olives do to a man's stomach?

Shrdlu

(Metalworking Outlook—Page 55)



"Dependable performance...matchless service —that's why our pressroom is 96% BLISS"

says Ben Suckle, President of Suckle Electronics Co., one of the largest custom sheet metal fabricators for the electronics industry.

The tail wags the dog in this modern-day Horatio Alger story:

Back in 1946, Suckle Electronics Company, a consulting firm specializing in radio and television engineering, decided to broaden the base of its business by entering the contract stamping business in a limited way.

The sky, though, turned out to be the limit. For today, a scant seven years later, Suckle Electronics Company is one of the largest custom sheet metal fabricators supplying the electronics industry.

"In our first year," says Ben Suckle, "a lack of capital forced us to build up our pressroom with second-hand equipment. We realized, however, that to meet the quick delivery demands of the electronics industry a dependable pressroom is a must. In 1948, we ordered our first new press—a Bliss. We quickly added more, and now there are 40. We standardized on Bliss because our experience proved that the Bliss presses can take our 96-hour-a-week operation, since Bliss replacement parts are truly interchangeable without machining or hand-fitting, and because engineering and other services offered by Bliss are eminently satisfactory."

If, like Suckle Electronics, you're looking for dependability in your pressroom, call a Bliss engineer. He will be glad to help you pick the proper press for your operation.

BLISS
SINCE 1857

on your press is more than a name...it's a *guarantee*

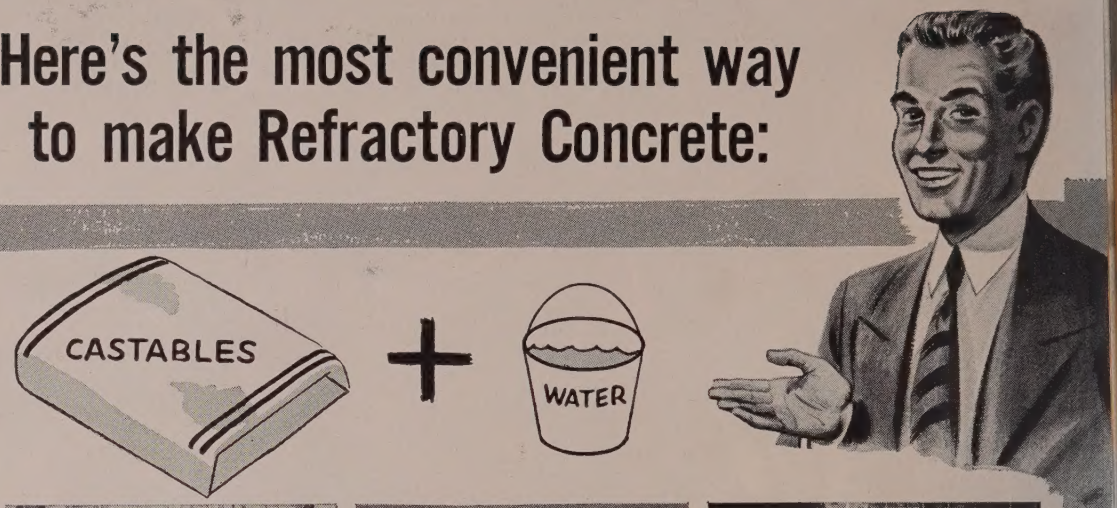
E. W. BLISS COMPANY, Canton, Ohio

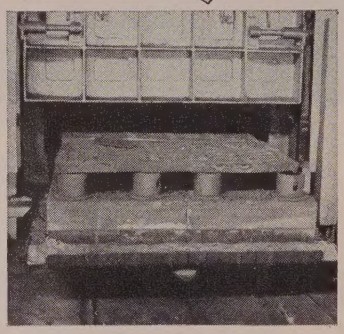
PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Paris) France

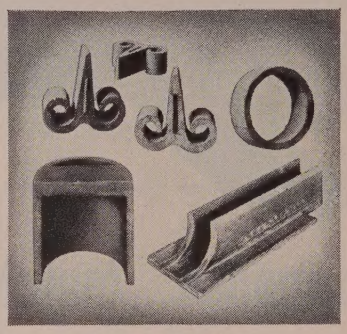
U. S. Plants in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. *West Coast Representatives:* Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. *Other representatives throughout the world.*

Here's the most convenient way to make Refractory Concrete:

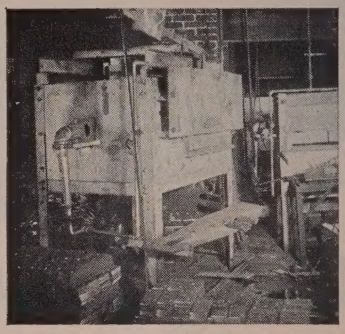




★ CAR TOPS
★ ARCHES ★ HEARTHS



★ SPECIAL SHAPES
★ CORE OVEN FLOORS



★ HEAT TREATING FURNACES
★ DOOR LININGS

IT'S THAT SIMPLE—Castable Refractories completely eliminate the need of finding suitable aggregates . . . and grading them to the right sizes. Packaged Castables come to you with Lumnite* calcium-aluminate cement and selected aggregates already mixed—needing only addition of water. The resulting Refractory Concrete reaches service strength in 24 hours or less.

This convenient way of making Refractory Concrete speeds work and cuts labor costs. It simplifies tough jobs—and some Castables are suitable for use at temperatures of 3000°F. or higher.

REFRACTORY CONCRETE made with Castables is the *adaptable* refractory. Easy to place in any size or shape.

No cutting or fitting necessary when you pour furnace walls, door linings and special shapes. There's no volume change to bother about. Build heat resistant floors, furnace walls, arches and hearths—Refractory Concrete withstands severe thermal shock, resists spalling.

In fact, you'll find Castables tailor-made for speed and convenience on many Refractory Concrete jobs. Handy for repairs, too.

CASTABLES to meet specific temperature and *insulation* requirements are made by manufacturers of refractories and sold by their distributors. For further information, write to LUMNITE DIVISION, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-54R

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.

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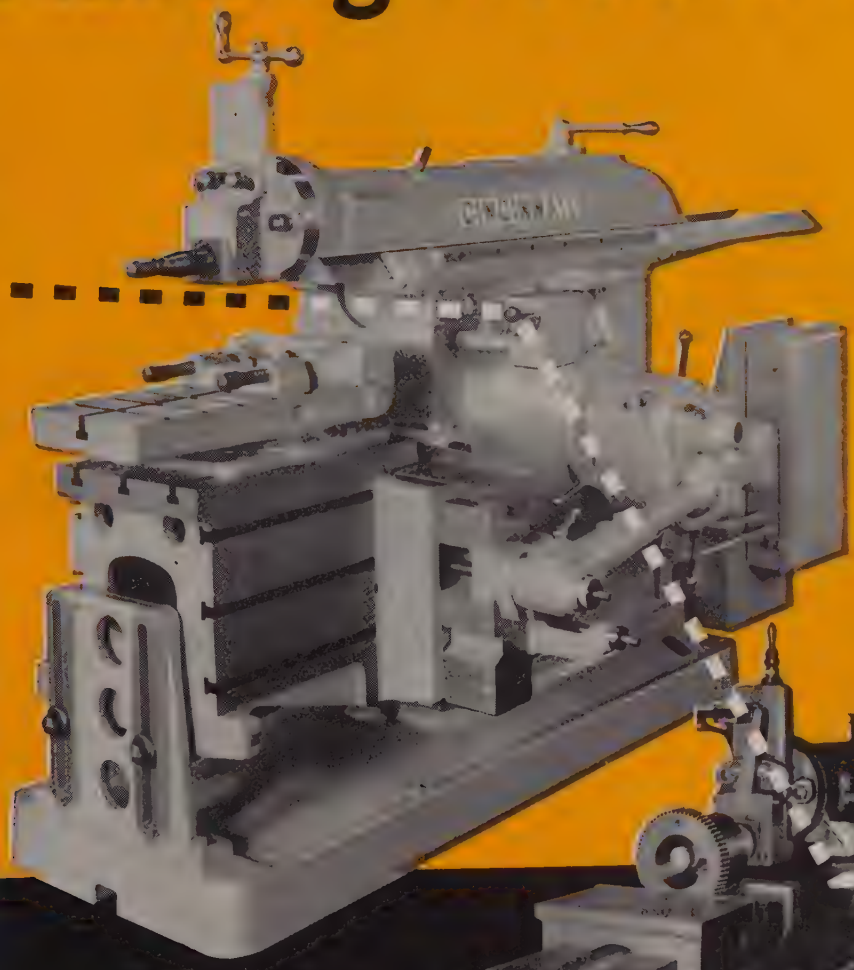
...Outstanding ACCURACY

Single Control Lever



e New Cincinnati Magnetic Clutch and Brake, with its gle, convenient control lever, gives the operator the fastest, mplest and most accurate control of his Shaper and converts ste time into productive time.

is powerful clutch and brake requires no adjustment, and s a long, maintenance-free life.

ite for Cincinnati Shaper Catalog N-5.

30% Time Saving

Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

KNOWN FOR DEPENDABILITY

ATLAS CARS

SCALE CAR
30-Ton Double Hopper Bottom

Car is equipped with very wide hopper with operator's platform above hopper to facilitate bin gate operation.

THE ATLAS CAR & MFG. CO.

1140 IVANHOE ROAD
CLEVELAND 10, OHIO

LETTERS
TO THE EDITORS

Question of Lineage

Please refer to your Technical Ou look item, "Steel Extrusion" (May 2 p. 95) which says, in part: "A significa paragraph from a recent paper deliver abroad by the father of hot extrusio M. J. Sejournet, reads . . . "

How come "father of hot extrusion" When in Germany for Bethlehem Ste Corp. in 1929, I was told that Manne mann in Witten, Germany, were exper menting with hot extrusion (paten went to Singer and Wibergeld). In 193 I saw commercial hot extrusion of ste pipes and tubes by Mannesmann i Witten, Germany. In 1935, they ha two presses and in 1939 they had thre presses.

Now who is the "father"?

W. Trink
R.D.
Ohiopyle, P

No Retrial for Socialism

We would like to have 100 copies o the editorial, "Criticism from the Left" (May 10, p. 67), by E. L. Shaner, editor-in-chief. It is our intention to send these to our salesmen and sales agents throughout the U. S.

J. B. Doar
chairma
American Tool Works Co.
Cincinnat

• *Quotations are being sent.—ED.*

All About Finances

Congratulations for your splendid special report entitled "Twenty-Ninth Annual Financial Analysis of the Steel Industry" (Apr. 12).

R. A. Redard
purchasing agent
Keystone Steel & Wire Co.
Peoria, Ill

A Metalworking Must

I was very much impressed with the article, "The Right Chip Breaker: A Metalcutting Must" (Apr. 26, p. 98).

As manufacturers' representatives, specializing in carbide tooling, we thought that reprints of this article to pass out to our customers would be valuable.

T. W. Montgomery
Allied Carbide Products
Jenkintown, Pa.

• *Quotations are being sent.—ED.*

Foresighted Request

Will you please send me tear sheets of the first four articles in STEEL's 1954 Program for Management series—"Now You Have To Sell" (Feb. 22, p. 91); "Build Better Bosses" (Mar. 22, p. 81); "Automation: How Far Should You Go? (Apr. 12, p. 87); and "Stabilizing Production and Employment" (May 17, p. 87)? They are excellent and I do not want to take the chance of finding

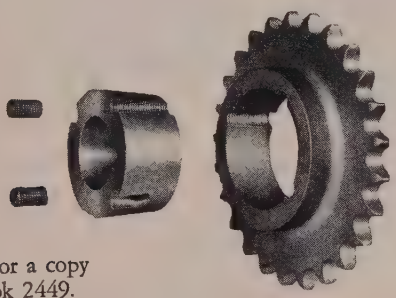
(Please turn to page 12)

SAVE TIME! SAVE MONEY!

Use Link-Belt roller chain sprockets with taper lock bushings

Faster, less expensive procurement!

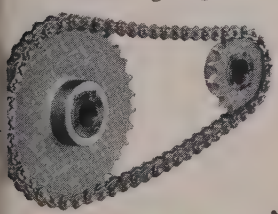
There's no delay for reboring when you need sprockets in a hurry. You can pick these *right off the shelf.* Stocks include sizes for single width chains from RC-40 through RC-160.



Send for a copy of Book 2449.

Faster, less expensive installation and removal!

No need to fit sprocket to shaft. Setscrews draw sprocket onto taper bushing, causing bushing to clamp tightly on shaft — equivalent to shrink fit. Turning setscrews in removal-holes quickly releases sprocket from shaft. Full bushing length supports sprocket on shaft.



AN IDEAL COMBINATION: Link-Belt Precision Steel Roller Chain and Link-Belt Sprockets

LINK-BELT

ROLLER CHAIN AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13,507

Another Bedford Mill Type Crane at Timken Roller Bearing Company

The Timken Roller Bearing Company has just installed a new 30-ton Bedford crane over the stripper building in their mill at Canton, Ohio. This is the second Bedford crane to be installed by the Timken Roller Bearing Company at Canton since July, 1952. The new crane has a 61′2″ span with 32′5″ lift. Built to AISE specifications, it has air-conditioned cab, worm drive gear on the hoist, and welded girders.

Proof of the superiority of Bedford cranes is found in the high percentage of repeat orders from important owners through the years.

Available in all types and sizes . . . from 5 tons to 350 tons, and up, for all kinds of indoor and outdoor services . . . each Bedford crane is individually engineered and precision built for its specific application.

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BEDFORD FOUNDRY & MACHINE COMPANY, INC. • BEDFORD, INDIANA

LETTERS

(Concluded from page 10)

no tear sheets available at the yea end.

Harold L. Mo
Hall-Scott Motor Divis
ACF-Brill Motors
Berkeley, Ca

• *Being Sent.—ED.*

Remarks on the Run

. . . incidentally, I think you a putting out a real fine magazine the days. The current issue (May 17) seen to be loaded with good stuff.

A. P. Barnaskey, manag
Westcott Chuck C
Oneida, N.

Small Article on Big Business

We found your article, "Renting . . . How To Go About It" (Apr. 12, p. 50 very interesting.

Our firm is extremely active in th field of industry financing in general and equipment leasing arrangements i particular. For that reason I was some what surprised to notice that in men tioning some other excellent organiza tions you omitted mention of Walter E Heller & Co.

D. L. Salinger
Walter E. Heller & Co
Chicag

• *Sorry we could not mention your firm. In the limited space available, we could mention only a few of the excellent organizations that are active in equipment leasing.—ED.*

Case of the Pipeline Story

I am enclosing p. 60 out of one of the recent issues of STEEL.

This page was torn out and mailed to me by my son who operates the Foothills Steel Foundry and is a subscriber to your magazine. I am interested in the article, "Coal by Pipeline." I telephoned the Foothills Steel Foundry this morning but they could not locate the magazine from which this page was torn.

I would appreciate it if you could locate that article and send me a complete set of tear sheets.

F. L. Irving
Black Nugget Coal Co. Ltd.
Calgary, Alta.

• *The article appeared in our Apr. 26, 1954 issue. A copy is being sent.—ED.*

Roundup on Improved Materials

Congratulations on your "Plan for Profit with Improved Materials" roundup (May 10, p. 113). I would appreciate your sending me three copies.

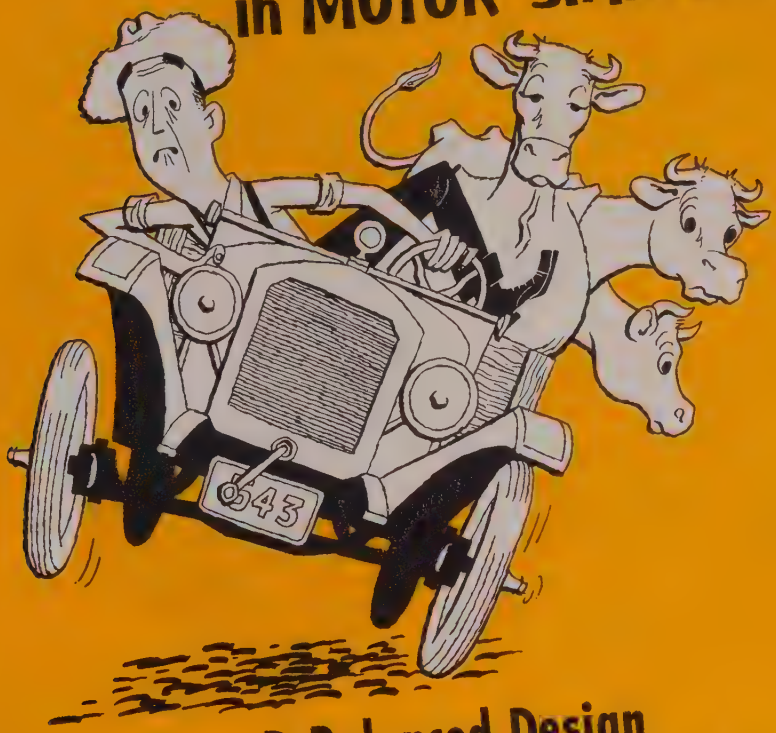
J. L. Roantree
Leeds & Northrup Co.
Philadelphia

• *Being Sent.—ED.*

I think that you did an amazingly good and comprehensive job of covering the metals field so extensively in your "Light Metals Forum" (May 10, p. 118) as part of the "Plan for Profit with Improved Metals" roundup of that issue.

Dudley T. Ross
Kaiser Aluminum & Chemical Corp.
Oakland, Calif.

Balance is important in MOTOR STARTERS, too!



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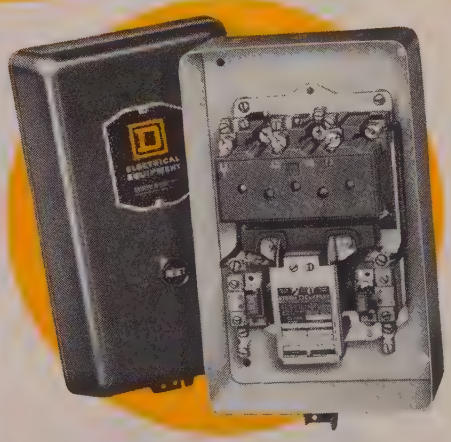

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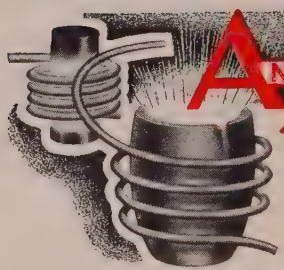
We would be pleased to show you actual cost data that other AJAX-NORTHRUP Furnace users have made available. Just write or telephone us.

541



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the pet theory...

of a Bird Cage manufacturer

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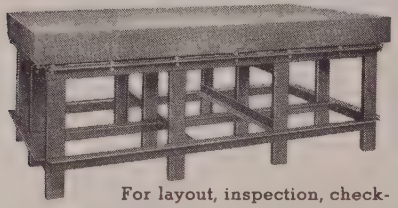

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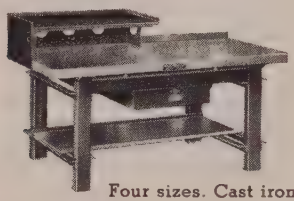

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25

TWENTY-FIFTH ANNIVERSARY

The

WEAN

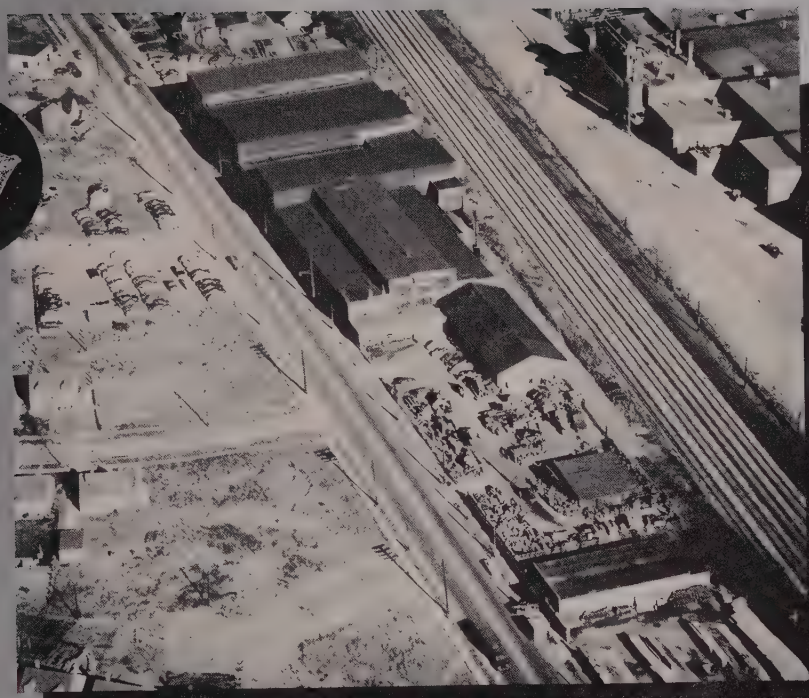
ENGINEERING
COMPANY · INC.
WARREN, OHIO

The WEAN ENGINEERING COMPANY, INC.

Twenty-five years ago — on June 28, 1929 — incorporation papers for The Wean Engineering Company, Inc. were taken out in Warren, Ohio. At that time the company consisted of a rented room in a bank building, a stenographer, a couple of desks, a telephone and many ideas for bettering the processes of steel finishing.

Today, The Wean Engineering Company, Inc. is housed in modern quarters, employing several hundred people. The organization is composed of what is acknowledged to be one of the finest groups of planners and equipment designers that work on steel mill facilities today. The original ideas have given birth to much of the equipment and methods accepted today as standard practice.

The following pages show a cross section of Wean sheet, tin and strip mill installations working in the mills of virtually every country where steel is produced.



Wean

QUIPMENT

ORPORATION

In 1941, Wean acquired the controlling interest in the Broden Construction Company of Cleveland. In 1947, this concern was reorganized and renamed the Wean Equipment Corporation and has specialized in the design and manufacture of high speed slitting and shearing lines; zinc, babbit, etc., coating lines for the steel processing industry, wire making and fence fabricating machinery and special equipment such as pictured on page seven.

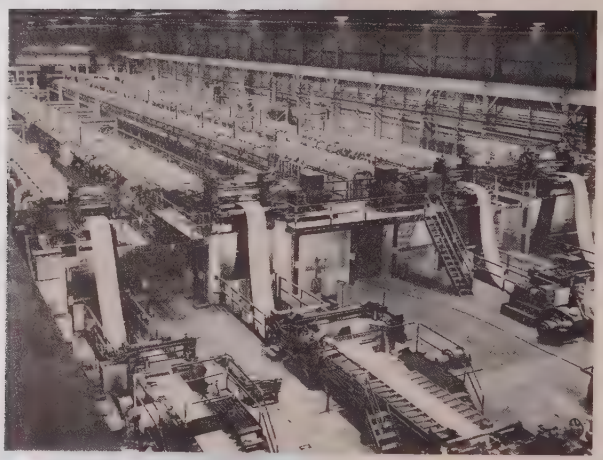
EAN

MANUFACTURING

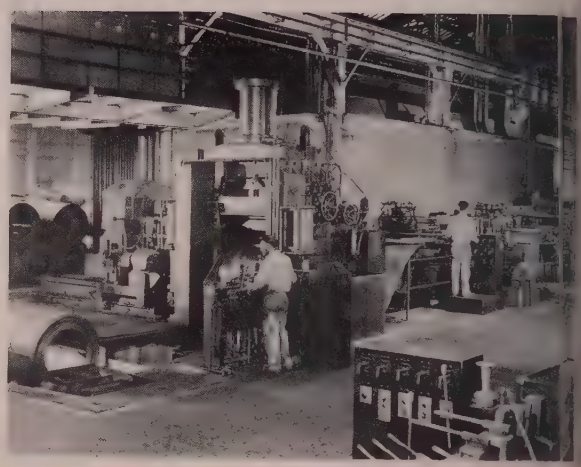
COMPANY

The shortage of storage and fabricating facilities of the late 40's prompted the Wean Engineering Company to set up its own plant for storing parts and assembling equipment. Thus, in 1949 the Wean Manufacturing Company in Warren, Ohio, became an important part of the producing facilities for the Wean companies.

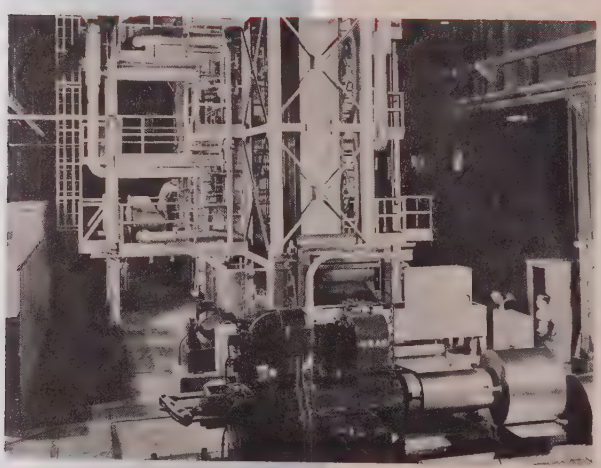
WEAN ENGINEERING COMPANY *Installations*



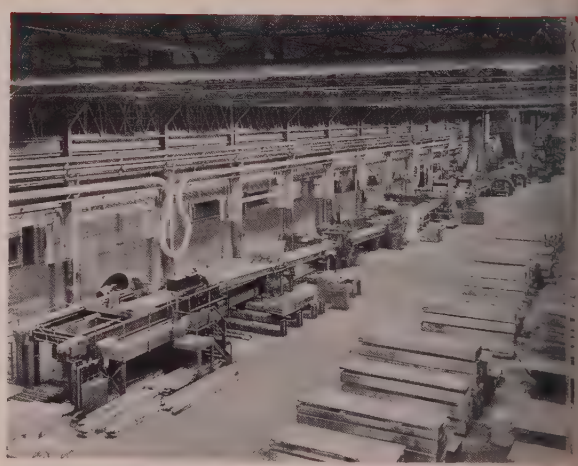
Four Wean Strip Pickle Lines



Hot Strip Shearing Line



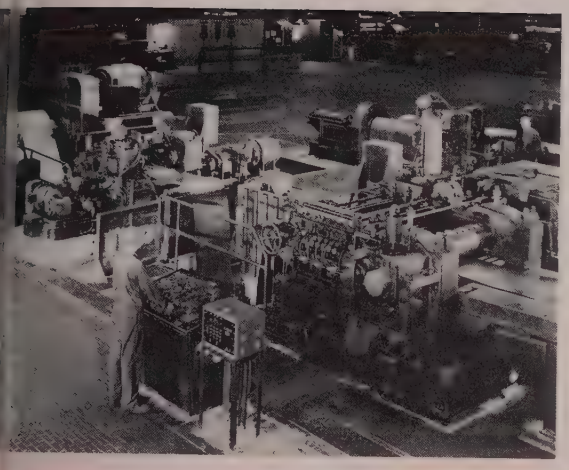
Continuous Strip Annealing Equipment



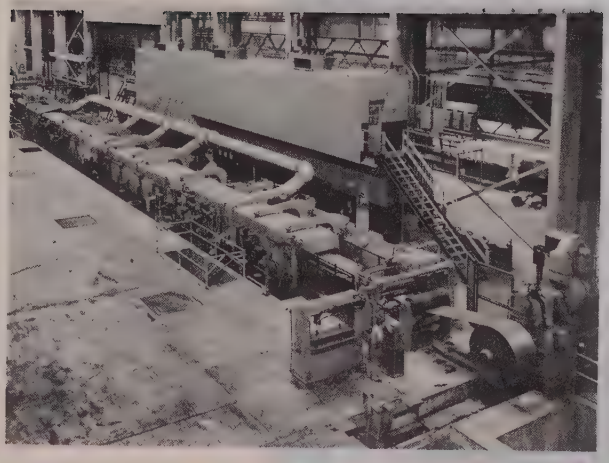
Continuous Strip Galvanizing Line

In the quarter century that the Wean Engineering Company, Inc. has been part of the American business scene there has actually been in progress a secon industrial revolution.

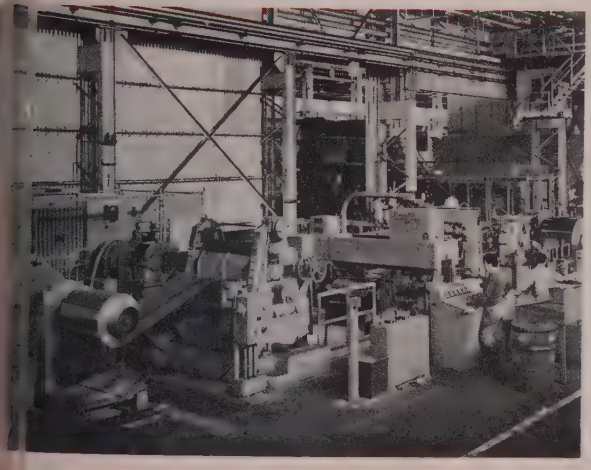
Methods employed to produce and process steel in the late twenties and earl thirties are no longer economical. The great demand for the various ste products, both for military and civilian purposes, has forced steel makers int demanding equipment that would produce steel faster and faster and, at th same time, develop new steels and improve old ones to make them mor compatible with modern fabrication methods. To do this and in an economic fashion, steelmaking began a long process of redevelopment. Wide strip ste



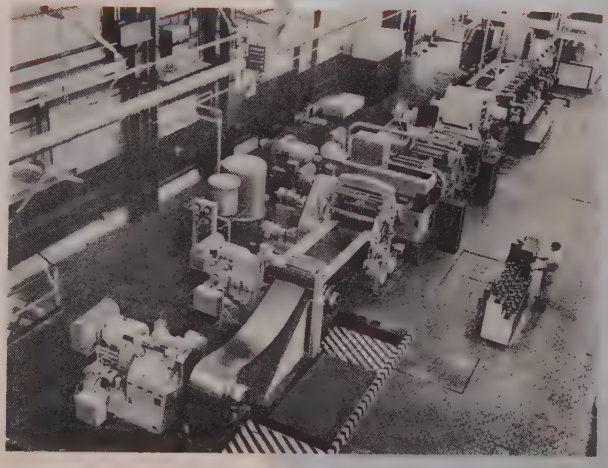
Cold Strip Shearing Line



Electrolytic Cleaning Line



Coil Preparation Line



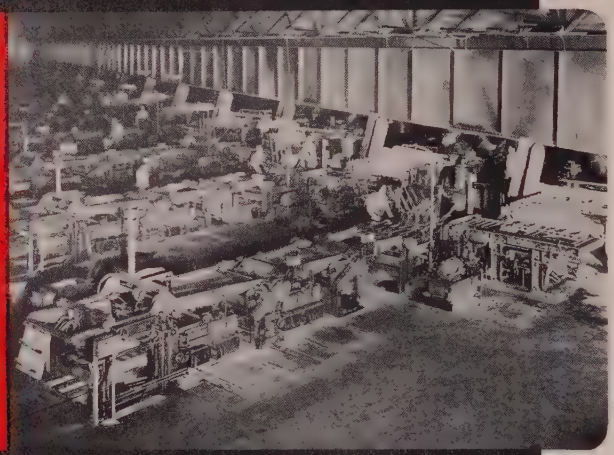
Electrolytic Tinning Line

placed sheets. Larger coils that would mean longer production runs became esirable. Continuous processing for annealing, coating, edging and coiling was eveloped and keeps the steel on the go in constantly increasing volume and at ven greater speeds.

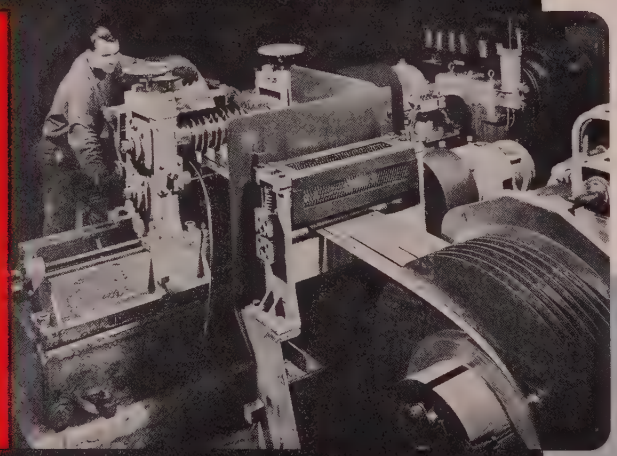
During the past 25 years, Wean engineers have played an important role in this evolution. It was these engineers who developed much of the continuous rocessing equipment and it was these engineers who championed high speed itting and shearing systems. In fact, wherever you see a modern sheet, tin or rip mill facility in operation, chances are a good part of the working equipment arries the Wean Engineering nameplate.

Continued →

Electrolytic Tinning Horizontal Plater



Hot Dip Tinning Equipment

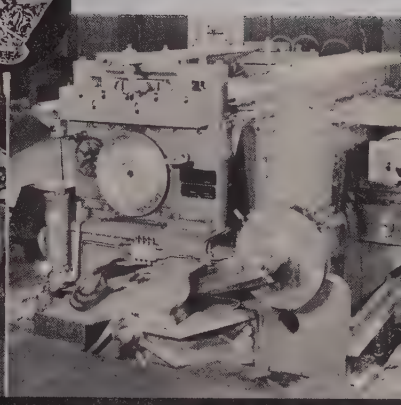


Slitting Equipment

WEAN ENGINEERING COMPANY ***Installations***

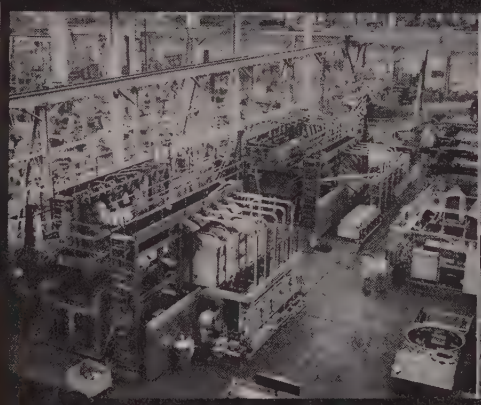
Wean EQUIPMENT CORPORATION

High Speed Slitting Lines

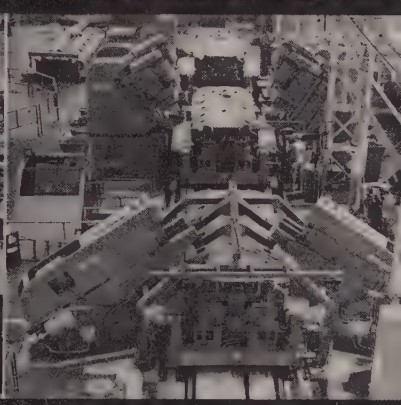


High Speed Straight, Hump an Trapezoidal Shearing Lines

Wire Making, Coating and Fabricating Machinery



Special Fabricating Machines*



Special Automation Equipment

*The Wean Equipment Corporation has had wide experience in designing and building equipment that "automates" the tough jobs. Pictured here are two typical examples: The first is a 350-ton grinding machine that handles a huge tank hull with ease while grinding multiple surfaces with exceptional precision. The second shows a trans car line for the handling, drilling, milling and boring operations on large military combat vehicles. Lines of this nature are being adapted to many manufacturing processes.

The WEAN ENGINEERING COMPANY · INC.
WARREN, OHIO

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WEAN EQUIPMENT CORPORATION
Cleveland, Ohio

THE McKAY MACHINE COMPANY
Youngstown, Ohio

FLINN & DREFFEIN ENGINEERING CO.
Chicago, Illinois

THE HALLDEN MACHINE COMPANY
Thomaston, Connecticut

THE DREVER COMPANY
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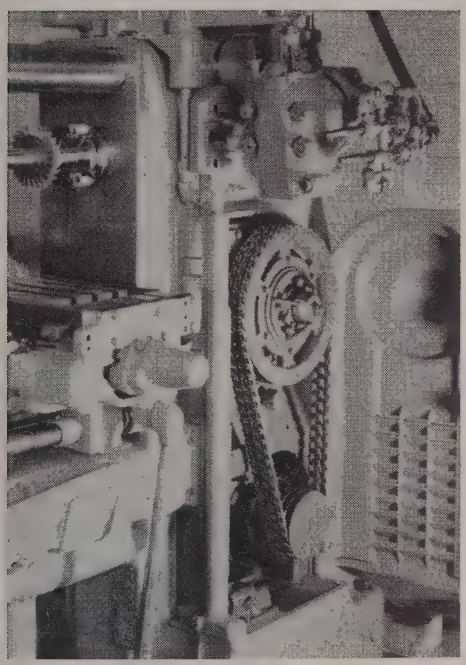
20% to 90% in your machines?



MACHINE vibration is usually caused by one or more of these five factors: bearings; motor; clutch; sheaves; v-belts. Frequently, v-belts alone are the major cause of vibration.

Actual performance on many different types of machine tools has proved that Veelos v-belts can reduce vibration 20% to 90%.

Here's why this is so...

Regular v-belts have spots of varying density due to their construction. These spots, though not apparent, throw the belt out of balance when the drive is operating. Vibration is created which not only can cause excessive wear on parts of the machine but which may also damage the finished work.

Veelos v-belts have none of these spots. Every Veelos belt is perfectly balanced throughout its entire length. Every Veelos link and stud is absolutely uniform. The smooth, machine-cut sides and the laminated construction of the belt assure full, vibrationless power delivery.

These facts can be readily demonstrated with an electronic analyser. This analyser measures amplitude of vibration to as low as 2-millionths of an inch. A few minutes is all that is required to show you that Veelos runs smoother and creates less vibration than regular v-belts.

Drop us a line or clip the coupon for a demonstration.

Veelos is known as Veelink outside the United States.

Manheim Manufacturing & Belting Company
613 Manbel St., Manheim, Pa.

Yes, I would like a demonstration with the electronic analyser.
Have your representative call me for a convenient time.

Name.....

Company.....

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American Screw relies upon its large batteries of National Cold Headers to give day-after-day quantity and quality production.

If you have a forging problem . . . large or small, hot or cold, ferrous or nonferrous . . . let us help you solve it. Send us prints, or a sample part, or better yet, visit us. No obligation.

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago

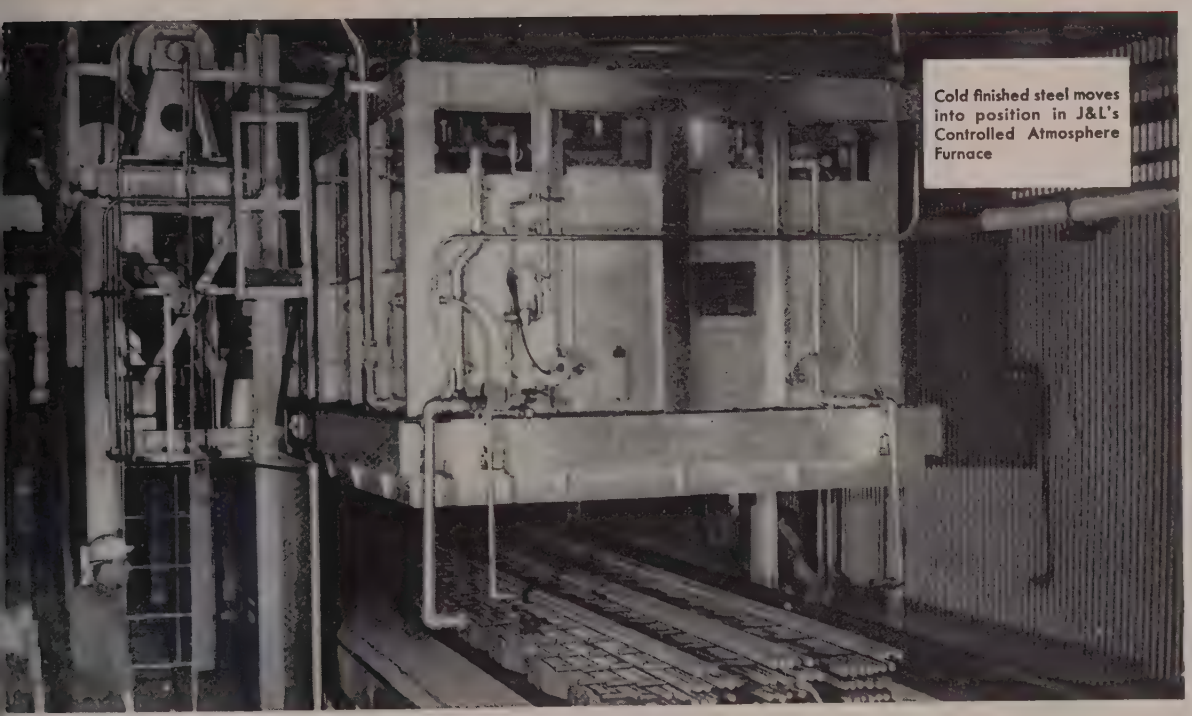
Cut Your Production Costs

whatever treatment you need:

- bright annealing
- case carburizing
- normalizing
- stress relieving
- carbon restoration

thermal treatment in prepared atmosphere furnace

saves you time
lowers over-all costs



Cold finished steel moves into position in J&L's Controlled Atmosphere Furnace

Why incur the trouble and costs of thermal treatments when J&L can do the job for you . . . quickly and economically? J&L's Controlled Atmosphere Furnace can be employed to improve the machinability or to meet the mechanical properties you need in your bar stock.

Order J&L Cold Finished Bars—thermally treated to the needs of your production line.

Jones & Laughlin Steel Corporation — Pittsburgh

J&L STEEL

Jones & Laughlin Steel Corp., Dept. 404
3 Gateway Center, Pittsburgh 30, Pa.

Without obligation please send me your booklet "Extra Services to Users of Cold Finished Steel."

Name_____

Title_____

Company_____

Address_____

Flame-hardened and
ways are standard

• Here a skilled G&L craftsman, using G&L developed equipment, flame-hardens ways for a 30 Series machine. The greater hardness helps maintain the higher, longer-lived machining accuracy you get with G&L machines.

recision-ground
n the G&L 30 Series

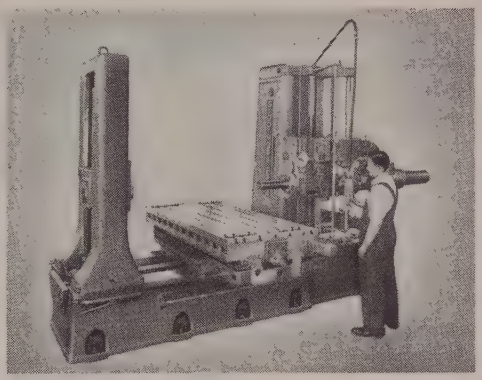
Hardened and ground bed and saddle ways are only one of the many plus features that are standard equipment on the G & L 30 Series table type Horizontals

IF you're searching for a horizontal boring, drilling and milling machine to handle large or small work, simple or complex set-ups, long or short runs — it will pay you to find out about the G&L 30 Series.

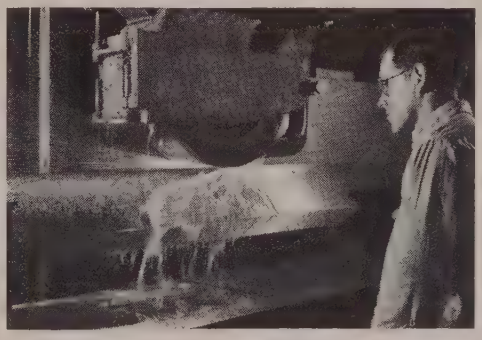
You'll discover that 30 Series machines allow you to perform boring, drilling and milling with equally high efficiency. You'll see, too, that no other machine on the market today offers you so many distinct performance and capacity boosting features as standard equipment.

Here are only a few of them — 45 all-geared spindle speeds in fine increments, 36 feeds, positive gear drive for heavier cuts, rapid change of feeds and speeds with full horsepower in the higher speed ranges.

Your investigation will convince you that a 30 Series machine is in a class by itself — often copied, never equaled. For complete details, see your G&L representative or write for the new 30 Series catalog.



There are two basic models in the 30 Series — the 340-T with 4″ spindle and 20 hp, the 350-T with 5″ spindle and 25 hp. Both machines offer a choice of three basic arrangements of table and saddle.



Hardened ways for bed and saddle are micro-finish ground, feature exceptionally accurate alignment.

GIDDINGS & LEWIS MACHINE TOOL CO.

FOND DU LAC, WISCONSIN

Builders of the world's finest heavy-duty machine tools — Horizontal Boring, Drilling and Milling Machines — table, floor and planer types; Hypro Double Housing and Openside Planers; Planer Type Milling Machines and Vertical Boring Mills; and Davis Cutting Tools

Ohio Ferro-Alloys Assures Stainless Steel Producers Additional Supply of LOW CARBON FERROCHROME in Growth Years Ahead

Since it was introduced in the 20's, production of stainless steel has more than doubled every decade. Industry leaders confidently predict this growth will continue despite temporary interruptions. There have been times in recent years when shortages of Low Carbon Ferrochrome severely hampered stainless production. To assure producers an adequate supply in the growth years ahead, Ohio Ferro-Alloys Corporation has added Low Carbon Ferrochrome to its line of quality ferro-alloys. Production schedules permit immediate shipment of these grades:

Max. 0.04% carbon
Max. 0.06% carbon
Max. 0.10% carbon
Max. 0.15% carbon
Max. 0.20% carbon
Max. 0.50% carbon

Other Ohio Ferro Products

- FERRO - SILICON 25 - 50 - 65 - 75 - 85 - 90%
- SPECIAL BLOCKING 50% FERRO - SILICON
- SILICON METAL
- HIGH CARBON FERRO-CHROME
- LOW CARBON FERRO-CHROME SILICON
- FERRO - MANGANESE
- SILICO-MANGANESE
- BOROSIL
- SIMANAL
- RARE EARTH ALLOYS

Briquets

- SILICON
- MANGANESE
- SILICO-MANGANESE
- CHROME

PHILO · TACOMA · BRILLIANT

Ohio Ferro-Alloys Corporation
Canton, Ohio

Chicago · Detroit · Pittsburgh · Tacoma · Seattle
Minneapolis · Birmingham · San Francisco · Los Angeles

CALENDAR
OF MEETINGS

7-10, Society of the Plastics Industry c.: National plastics exposition, Public uditorium, Cleveland. Society address: 67 . 44th St., New York 36. Executive vice esident: William T. Cruse.

9-11, American Society for Quality Con-ol: Annual convention and exhibit, Hotel fferson, St. Louis. Convention manager: ade R. Weaver, Republic Steel Corp., Re-ublic Bldg., Cleveland.

9-12, National Society of Professional ngineers: Annual meeting, Schroeder hotel, ilwaukee. Society address: 1121 15 St., W, Washington 5. Secretary: P. H. obbins.

10, Aluminum Extruders Council: Meet-g and technical conference, Barbizon Plaza otel, New York. Information: Phillip emelman, executive secretary, 209 Wash-gton St., Boston, Mass.

10-11, Magnesium Association: Mid-year eeting, Seigniory club, P. Q., Canada. ssociation address: 122 E. 42nd St., New ork. Assistant secretary: Martha I. Hansen.

13-16, American Boiler Manufacturers ssociation & Affiliated Industries: Annual eeting, The Homestead, Hot Springs, Va. ssociation address: 1571 W. 117th St., leveland 7. Secretary: A. C. Baker.

13-17, National Industrial Service Asso-ation Inc.: Annual meeting, Hotel Statler, etroit. Association address: 818 Olive St., . Louis. Information: Horace Barks.

13-17, National Association of Cost Ac-untants: International cost conference, otel Conrad Hilton, Chicago. Association ddress: 505 Park Ave., New York 22. ecretary: A. B. Gunnerson.

13-18, American Society for Testing Ma-rials: Annual meeting and exhibit, Hotels herman and Morrison, Chicago. Society ad-ress: 1916 Race St., Philadelphia 3. Execu-ve secretary: Robert J. Painter.

14-15, Malleable Founders' Society: An-ual meeting, Seigniory Club, P. Q., Canada. ociety address: 1800 Union Commerce Bldg., leveland 14. Managing director: Lowell D. yan.

14-17, American Society of Mechanical ngineers: Oil and gas power conference, uehlebach hotel, Kansas City, Mo. Society ddress: 29 W. 39th St., New York. Secre-ry: C. E. Davies.

14-19, American Society of Civil Engi-eers: Spring meeting, Chalfonte-Haddon all, Atlantic City, N. J. Society address: 3 W. 39th St., New York. Executive sec-tary: Col. William N. Carey.

15-17, Radio-Electronics-Television Manu-acturers Association: Annual convention, almer House, Chicago. Association ad-ress: 777 14th St., NW, Washington 5. ecretary: James D. Secrest.

20-23, Aviation Distributors & Manufac-rers Association: Mid-year meeting, Stan-y hotel, Estes Park, Colo. Association ad-ress: 1900 Arch St., Philadelphia 3. Ex-cutive secretary: H. Donald Richards.

20-23, National Metal Trades Association: Western plant management conference, rench Lick, Ind. Association address: 122 . Michigan Ave., Chicago 3. Secretary: harles L. Blatchford.

20-24, American Society of Mechanical ngineers: Semi-annual meeting, William enn hotel, Pittsburgh. Society address: 29 . 39th St., New York. Secretary: C. E. avies.

21-23, American Management Association: eneral management conference, Hotel tatler, New York. Association address: 330 . 42nd St., New York 36. Vice president-ecretary: James O. Rice.

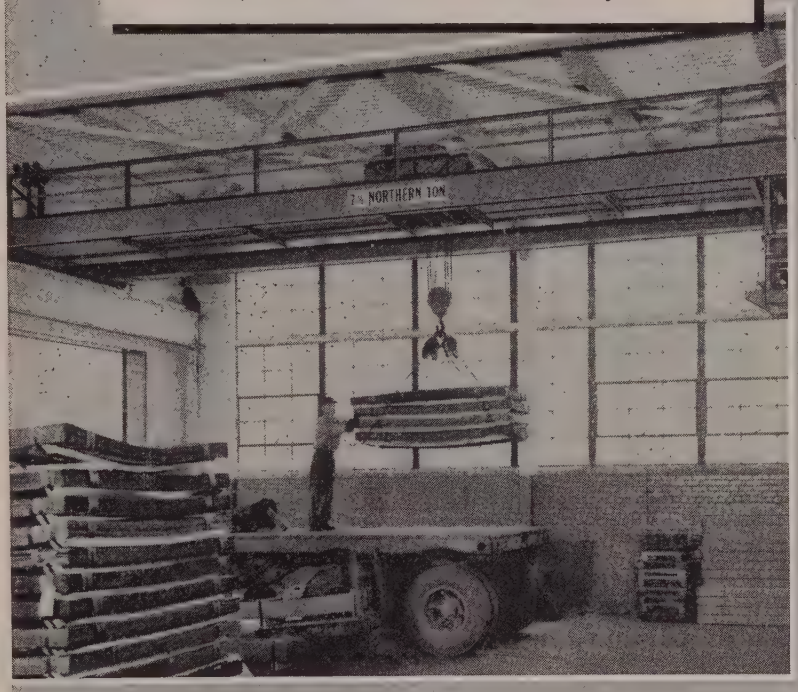
21-25, American Institute of Electrical ngineers: Summer and Pacific general eeting, Hotel Biltmore, Los Angeles. In-itute address: 33 W. 39th St., New York 8. Secretary: N. B. Hibshman.

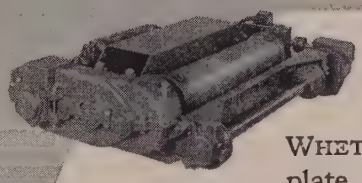
27-29, Alloy Casting Institute: Annual eeting, The Homestead, Hot Springs, Va. nstitute address: 32 Third Ave., Mineola, . Y. Executive vice president: E. A. choefer.

NORTHERN

HI-LIFT CRANES

keep them rolling!





WHETHER handling strip, sheet, plate, structural steel or finished parts, a Northern Hi-Lift Crane helps keep your trucks and trailers rolling to make scheduled deliveries; handles big, heavy loads for fast loading; saves time, cost, and ruffled tempers.

For over fifty years Northern Cranes have consistently stressed three essential elements —safety, durability, dependable operation— with ample provision for meeting emergency demands under peak material handling conditions. They keep your production moving and your shipments rolling!

Write for our new Bulletin HL-115

NORTHERN ENGINEERING WORKS

210 Chene St., Detroit 7, Michigan

OVERHEAD ELECTRIC TRAVELING CRANES AND HOISTS

Endless Energy . . .

THANKS TO BATTERY POWER!

Industrial trucks work like beavers all day long when they're powered with new Gould "Thirty" Batteries with Diamond "Z" Grids. These batteries have *extra* strength, *extra* ruggedness, *extra* ability to work harder, longer, and at lower cost. Silent, safe, fume-free—there's *no* power like battery power, *no* battery power like *Gould* power.

Specify
THE GOULD "THIRTY"
with New Diamond "Z" Grids—
America's Finest Industrial Truck Battery

GOULD *INDUSTRIAL BATTERIES*

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

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Sunshine State Skyscraper

The modern 22-story South-Central Home Office Building of the Prudential Insurance Company of America, highest office building in Florida, will dominate the skyline of fast-growing Jacksonville.
Architects: Kemp, Bunch & Jackson.
General Contractor: Daniel Construction Company.

TWO HIGHS for Ingalls in Florida

Entirely different problems with one dependable source of solution. That's the story of *Ingalls* construction in these two magnificent Florida structures. Adaptability has always been a keystone of *Ingalls* service; it is amply illustrated here. Whatever your special construction problem may be, make certain to *see Ingalls first* for your own new high in building satisfaction.

FOR COMPLETE INFORMATION WRITE INGALLS

THE INGALLS IRON WORKS COMPANY

BIRMINGHAM, ALABAMA

SALES OFFICES: New York, Chicago, Pittsburgh, Houston
PLANTS: Birmingham, Ala., Verona Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.

Fabricated Steel for:

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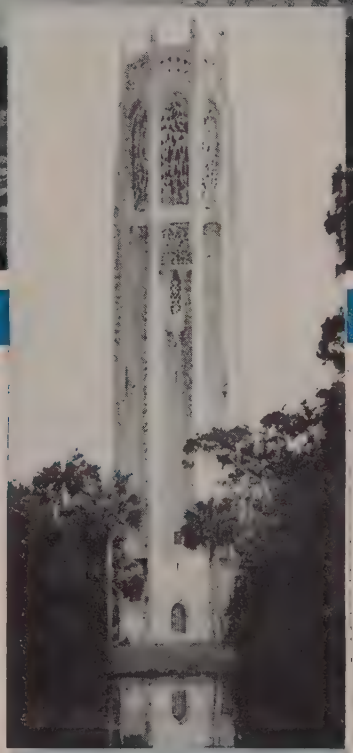
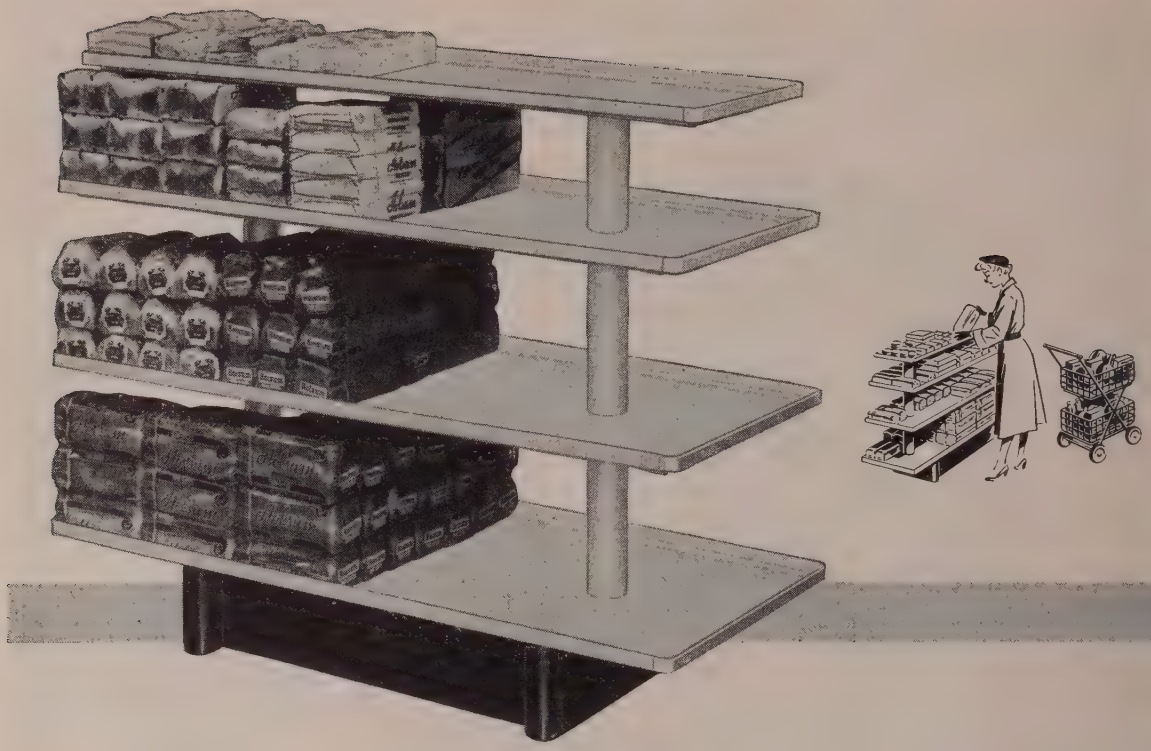
Industrial Buildings • Tanks • Bins • Pressure Vessels • Stacks



Bok Tower

The famous Bok Singing Tower at Lake Wales, Florida, is one of the nation's notable beauty spots—a spire created for endless inspiration, placed in a magnificent floral background.



The finish was only the beginning

A baked-enamel finish applied to Republic Electro Paintlok was the beginning of customer-attracting appearance and longer service life for this bakery goods display.

The unit is made by Modern Metal Products Company, Greensboro, N. C.

Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them for years.

Selection of Electro Paintlok for this application was based on the company's success in fabricating it for other products. They knew the tight zinc coating would not crack, peel or flake during normal fabricating operations.

They also knew their entire finishing operation would be speeded.

Electro Paintlok requires no special cleaning—only the removal of finger marks and warehouse dirt. The surfaces require no pre-etching. They are pre-conditioned for application of the baked-enamel finish.

Why not consider Republic Electro Paintlok for making your fabricated steel products more attractive, more serviceable, at less cost?

REPUBLIC STEEL CORPORATION

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL

REPUBLIC ELECTRO ZINC PLATED SHEETS

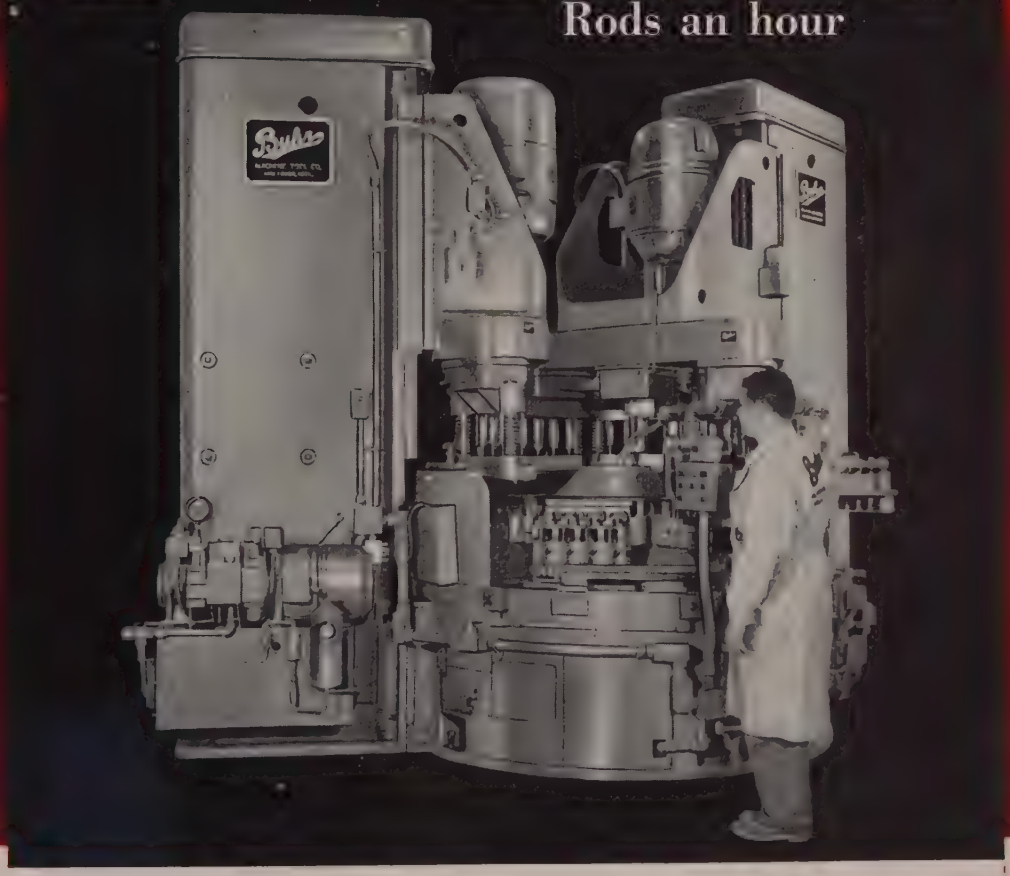
ELECTRO PAINTLOK • ELECTRO ZINCBOND

Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron

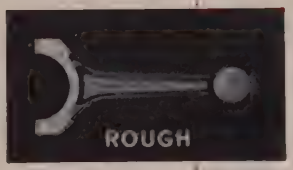
Buhr

SPECIAL...

Drills, reams and chamfers 565 Connecting Rods an hour



This Two-Column Automatic Drilling Machine
is arranged with tool-steel, laminated, hardened and ground ways.
Heavy-duty ball-bearing construction provided for all spindles.
The eight-station holding fixture is mounted
on 60″-diameter automatic Index Table.
Parts are manually loaded, hydraulically clamped and automatically ejected.
All installations comply with J.I.C. Standards.
Automatic lubrication throughout Machine.
Special safety features . . . Only one operator required.



BUHR MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

Buhr **MULTIPLE-SPINDLE HIGH PRODUCTION MACHINERY**

the staff 'without portfolio'

Industrial processors who choose Microhoning are gaining more than a precision-production method of processing. A single source of responsibility for the complete honing operation . . . including machine, tool, fixture, abrasive, and accessory performance . . . is saving them servicing time and expense.

Microhoning's capacity to remove stock, produce a truly round and straight bore, automatically control size, and develop a consistent functional finish . . . is assured by Micromatic's staff of skilled engineers.

This nationwide group of technicians puts into action its cumulative experience to bring out the full potential of every installation. It is a staff which covers every honing phase in projecting Micromatic's acceptance of undivided responsibility.

In effect, it is the customer's staff 'without portfolio.'

1929 • 1954
PRECISION PRODUCTION THROUGH MICROHONING
MICROMATIC
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25TH YEAR OF DEVELOPMENT

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Hydraulic controls • Diesel fuel injection equipment

New BOOK for You!

on Stainless Fasteners

This new publication gives you at a glance the complete story on the standard line of American Stainless Fasteners . . . prices, sizes and head styles of wood, machine, and tapping screws. And it gives you a practical check-list of points to consider in selecting the right American Stainless Fastener . . . standard or special . . . for your particular application. A copy is yours for the asking. Write for it today.

P.S.: In developing *special* stainless fasteners, American's "stainless reputation" is your assurance of top results at lowest cost. American engineers will go over your problem with you, any time you say.

SINCE 1838

AMERICAN SCREW COMPANY

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Looking for a special "character" in Spring Steel, to improve your product?

Check with Sandvik

Wherever spring steel *performance* is vital, it pays to look into the "character" of the steel you specify. By "character" we mean the inherent quality of the material which enables it to meet tough physical demands.

Sandvik Swedish strip steels have a special "aptitude" for tough applications. (For example, take a look at the partial list below). The extraordinary "character" of Sandvik steel results from a basic purity of raw materials, plus specialized methods and close control maintained throughout processing. This assures consistent, successful performance coil after coil, lot to lot.

Sandvik cold rolled high carbon strip steel is available:

- In special analyses for specific applications.
- Precision-rolled in thicknesses to fit your requirements.
- In straight carbon and alloy grades.
- Annealed, unannealed or hardened and tempered.
- Polished bright, yellow or blue.
- With square, round or dressed edges.
- Wide range of sizes in stock—also slitting facilities available.

SANDVIK Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical instruments, etc. • Razor Blades • Reeds • Shock Absorbers • A Wide Variety of Springs • Trowels • Vibrator Reeds • Piston Ring Segment and Expanders, etc.

Sandvik also supplies high quality Swedish Magnet Iron Strip and Wire for specialized electrical purposes such as direct current relays, electromagnetic brakes, couplings, chucks etc.

HIGH FATIGUE LIFE?

SPECIAL PHYSICAL PROPERTIES?

FINER SURFACE FINISH?

MORE UNIFORM HARDNESS?

Ask your nearest Sandvik office for further information or technical assistance.

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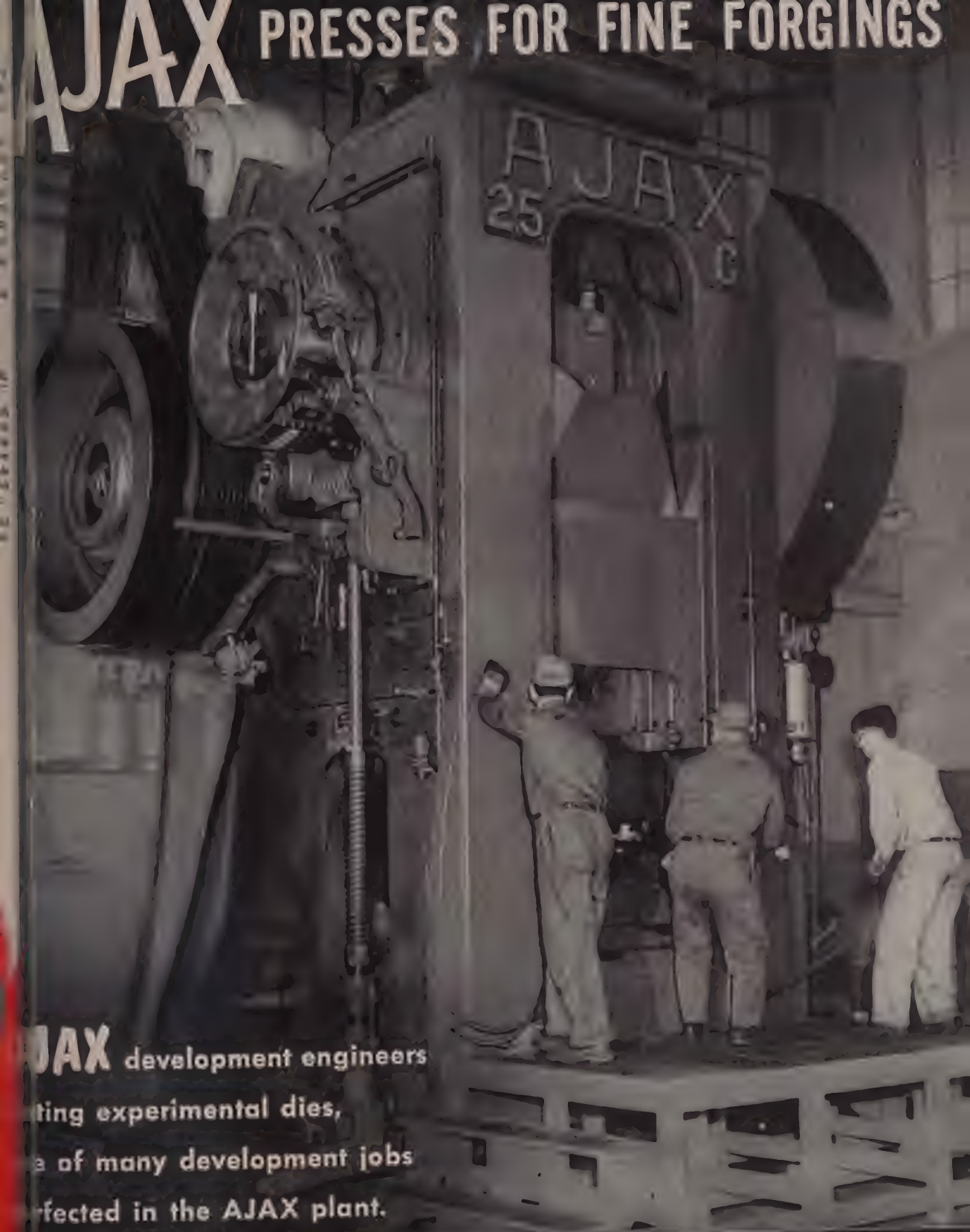

JAX development engineers
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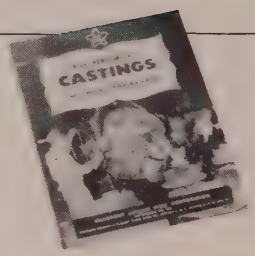
"We need BIG Stainless Castings"

"Our Stainless Castings are Special"

"BIG"–"SPECIAL"–"TINY"–"INTRICATE"...

We can handle any job you have



Write for your copy: "ALLEGHENY METAL CASTINGS"

32 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

ADDRESS DEPT. S-54

Our Buffalo Foundry produces high-alloy steel castings *exclusively* . . . principally for corrosion and heat resisting applications. We've had long and valuable experience (as a pioneer in both vertical-centrifugal and static stainless casting methods) with practically every type of service condition you can name, and we'll welcome the opportunity to take on any stainless, high-temperature or high-strength casting problems you have.

And not just as a matter of meeting the service conditions, either. We're ready to handle any special shape or difficult-to-cast section your job may require . . . and any size of casting from a few ounces to several tons.

● *Let us quote on your requirements.* You'll find Allegheny Metal castings unsurpassed for soundness, clean-grained strength and easy machining qualities. Uniform, too, and reliable in supply. *Allegheny Ludlum Steel Corporation, Henry W. Oliver Building, Pittsburgh 22, Pennsylvania.*

You can make it **BETTER** with

Allegheny Metal

AL® TIME-TESTED STAINLESS STEEL

W&D 5006 **Warehouse stocks carried by all Ryerson Steel plants**

Make Your Short-run Jobs Profitable...

. . . **Brown & Sharpe Hand Screw Machines.** There's real economy in handling small quantity bar-stock and second-operation work on a No. 00, No. 0, or No. 2 Hand Screw Machine. Rush jobs, that might otherwise disrupt your automatic production, can be quickly dispatched . . . and at a *profit*, too. Moreover, tooling is economical. These Hand Screw Machines use the same collets, fingers, and many of the tools used on the Automatics. Write for Bulletins which fully describe the high-efficiency features of these three Hand Screw Machines.

Brown & Sharpe

America's Only Micrometers with Stainless Steel Spindle and Screw!

New Brown & Sharpe Micrometers give you complete protection from rust and stain—the common causes of excessive wear and loss of reading accuracy. Exclusive stainless steel, one-piece spindle and screw with hardened and ground threads is permanently rust-proof. Dull chrome frame and thimble resist acid perspiration and other causes of stain. Many other quality features, such as carbide measuring faces, give these new micrometers long lasting accuracy—make them easier to use. Write for Catalog 35M and read all about the hundreds of precision hand tools made by Brown & Sharpe.

BUY THROUGH YOUR LOCAL DISTRIBUTOR

Brown & Sharpe B·S

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Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
Machinists' Tools • Electronic Measuring Equipment • Johansson Gage Blocks
Permanent Magnet Chucks • Pumps

Printed in U.S.A.

"You've got to use the right club!"

Par 3—140 yards—plenty of trees—looks like a full 7 iron or me."

'd probably be better off with a number 6."

Funny how identical shots sometimes demand different ubs. Again, the old thing of picking the right tool for the ob. It's like we were saying the other day about that ondenser tube for Jones & Company—you felt sure we eeded a different alloy—and you certainly proved it to ur satisfaction!"

Well, Jack, I think everyone agrees, specialization is a ust. For example, one of our products, Wolverine Trufin*, is roduced in four different forms—each designed to meet specialized customer need. One of these four types will andle just about any finned tube job."

We're using your Trufin Bi-metal in our plant now, Bill."

That's type L/C. It has aluminum fins and a copper lining. Ve produce other types that are used in shell and tube heat xchangers and condensers, water heaters and hot air pplications."

You people keep talking one piece construction whenever ou mention Trufin."

"We sure do. The fins are literally squeezed right from the tube wall. Because you have the integral construction, the tube retains its higher rate of efficiency through changes in temperature, pressure and vibration."

"Trufin efficiency is another big advantage, Jack. It gives you more surface condensing capacity within a given area and requires far less space to do a bigger job for you."

IF STEPPED-UP EFFICIENCY IS PAR FOR THE COURSE: then you'd better investigate the multi-fold possibilities of Trufin —right now! It's available in copper, copper-base alloys, aluminum and electric-welded steel. And write for a copy of Wolverine's Trufin data sheet. It's a handy thing to have! WOLVERINE TUBE DIVISION of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

*REG. U.S. PAT. OFF.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario.

EST. 1916

WOLVERINE TUBE DIVISION

OF CALUMET & HECLA, INC.

Manufacturers of Quality-Controlled Tubing

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES.

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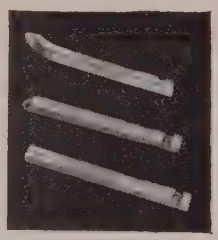
Good News for Pipe Smokers



*Another example of how Carpenter *Application Engineering Service is helping industry cut costs, build sales.*

Once a good pipe is "broken in", you can look forward to many hours of smoking pleasure. That is, provided you have an easy way to keep the inside of the pipe bowl in good shape. That's the reason for this reamer type pipe cleaner. You simply insert it in the bowl, turn the expanding blades to fit, then rotate the cleaner to remove excess "cake". These cleaners now sell all over the country . . . but here's the interesting story on how the manufacturer hurdled problems in perfecting the device:

The "heart" of the cleaner is in the cutting blades. For these, the manufacturer was using cold rolled steel, chrome plated. However, plating costs were too high . . . running 7c per blade. Also, plating produced a rounded, inefficient cutting edge. And to make matters worse, one out of three plated blades had to be rejected.

At this point the manufacturer called in Carpenter and Application Engineering Service went to work. The Carpenter representative recommended a *stainless* steel, Carpenter No. 5, Type 416. Results: Plating costs are eliminated, blades take and hold sharp edges to make a vastly improved product . . . and rejects are a thing of the past.

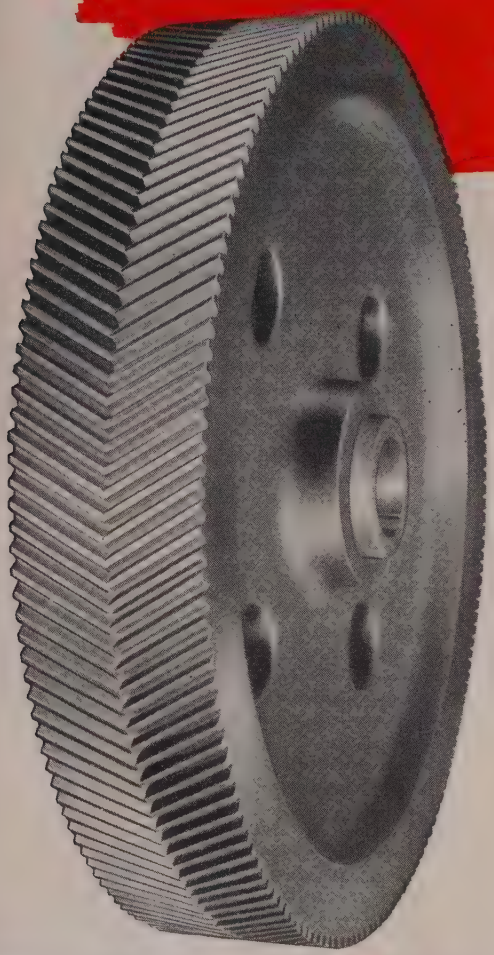
On product after product . . . from kitchen cutlery to parts for critical instruments . . . Carpenter Application Engineering Service has helped industry find the one steel best suited to cut costs, improve performance. For A.E.S. brings to your designers, purchasing men and production heads the benefits of almost 70 years' experience in applying specialty steels. This program has been the guiding force behind improved steels and totally new steels by Carpenter to make possible the "impossible". A.E.S. goes to work for your plant as soon as you get in touch with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

balanced △ design



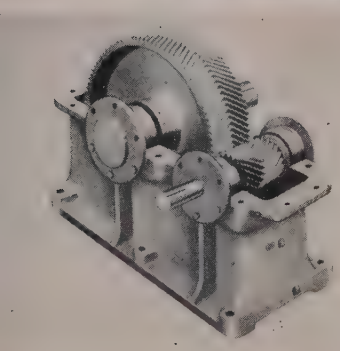
BALANCED DESIGN . . . adds to the life of Philadelphia Herringbone Gears and Speed Reducers. In addition to the Sykes continuous tooth, Philadelphia also manufactures Staggered or Separated tooth gears of the Herringbone type in sizes up to 150 inches diameter. For heavy duty industrial drives, the Herringbone Gear provides maximum efficiency and economy.

EFFICIENT, because overlapping tooth design provides smooth, quiet power transmission with almost no power loss between gears.

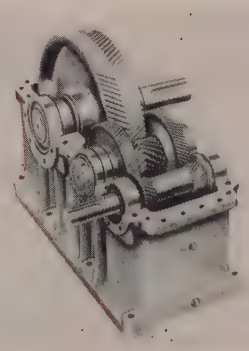
ECONOMICAL, because the Herringbone tooth design has greater inherent strength, thus permitting the use of gears of less dimensions than might otherwise be employed. Also, the balanced axial thrust forces eliminate the necessity of heavy bearings to absorb these forces.

The balanced design of Philadelphia Herringbone Reducers is carried one step further in completely balanced gear units. Philadelphia reducers, illustrated below, show how the Herringbone and opposed helical gears are nestled within one another,—thus providing a wide, stable housing with balanced gear and bearing loads.

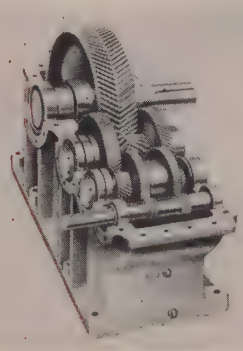
Write for Catalogue H-49.



Single Reduction Type



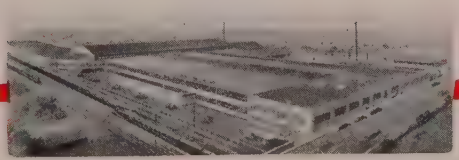
Double Reduction Type



Triple Reduction Type

PHILADELPHIA GEAR WORKS, INC.

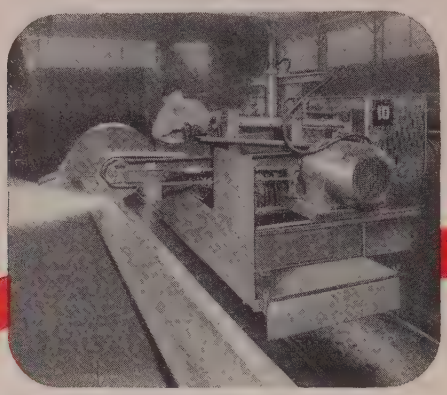
ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
W YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

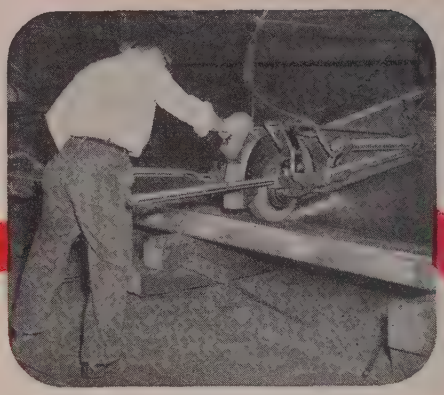


Industrial Gears & Speed Reducers

LimiTorque Valve Controls

No matter what grinding method you use...





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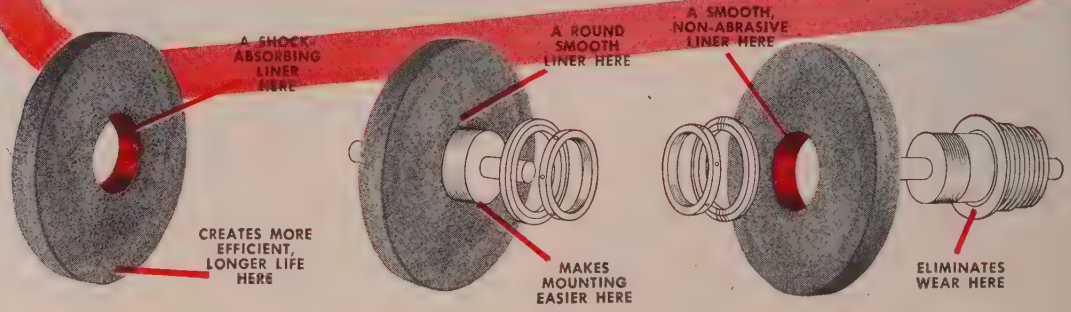
Here are the two big reasons for Mid-West's low-cost efficiency. They're ready to go to work for you!

1. Mid-West designed fiber-cushioned arbors minimize vibration. They're baked-in shock absorbers bonded in for life!

2. Mid-West snagging wheels' extra-tough bonds are designed especially for billet snagging, grinding of steel and alloy castings, and snagging operations on all types of non-ferrous metals and cast irons.

Here is real grinding efficiency that's bound to help you cut high production costs. For complete information—write, wire or phone today.


A SHOCK ABSORBING LINER HERE
A ROUND SMOOTH LINER HERE
A SMOOTH, NON-ABRASIVE LINER HERE
CREATES MORE EFFICIENT, LONGER LIFE HERE
MAKES MOUNTING EASIER HERE
ELIMINATES WEAR HERE

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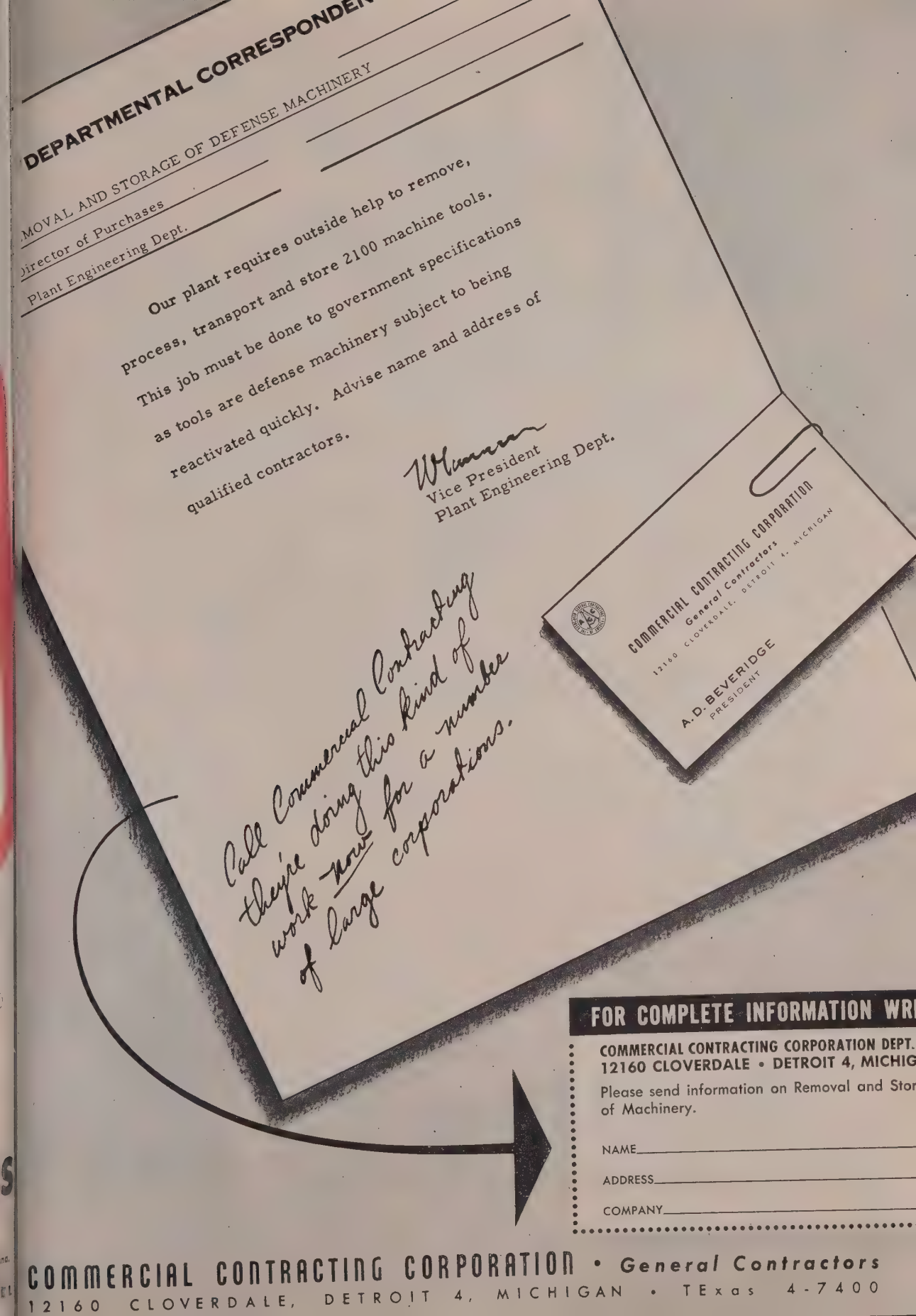
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MOVAL AND STORAGE OF DEFENSE MACHINERY
Director of Purchases
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Our plant requires outside help to remove,
process, transport and store 2100 machine tools.
This job must be done to government specifications
as tools are defense machinery subject to being
reactivated quickly. Advise name and address of
qualified contractors.
Vice President
Plant Engineering Dept.
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A. D. BEVERIDGE
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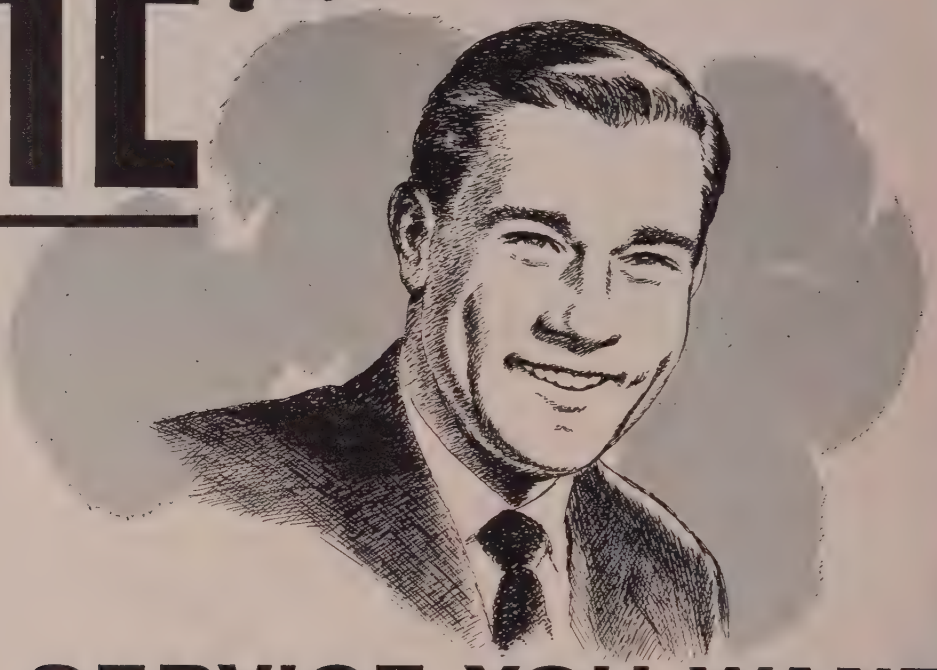
HE *has it!*



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NO NEED to look up a supply source every time you buy Bronze Bearings and Bars. Your industrial distributor is permanently situated in your local area to serve you with Bunting Products and an infinite variety of countless other items.

YOUR BUNTING distributor is the leading industrial distributor, or a stock-carrying specialist in certain industrial items. With money-saving convenience, he can supply hundreds of different sizes of completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars.

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DIVERSITY OF EQUIPMENT for METAL WORKING

500 ton Hydraulic Press

Erie 4 roll Board Drop Hammer

Erie 25,000 lb. Steam Hammer

Erie Trimming Press

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Erie Single Frame Forging Hammer

Erie 335 ton Hydraulic Press

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FOR more than half a century Erie Foundry Company has served the metal-working industry with top performance steam and air operated hammers, board drop hammers, double and single frame forging hammers, trimming presses and hydraulic presses. Before making your selection consult with our engineers.

Bulletins on all of these products are yours on request.

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Dependable FORGING HAMMERS • HYDRAULIC PRESSES

MELTRITE
PIG IRON

Increased Productive Capacity

To Meet The Needs of Industrial America

MORE USED THAN ANY OTHER MERCHANT PIG IRON

This is the new and larger Federal "A" furnace in the Chicago district—62% increase in capacity over the old furnace. Productive capacity has been increased also at both Toledo and Erie.

Foundry Service Department Available Without Obligation

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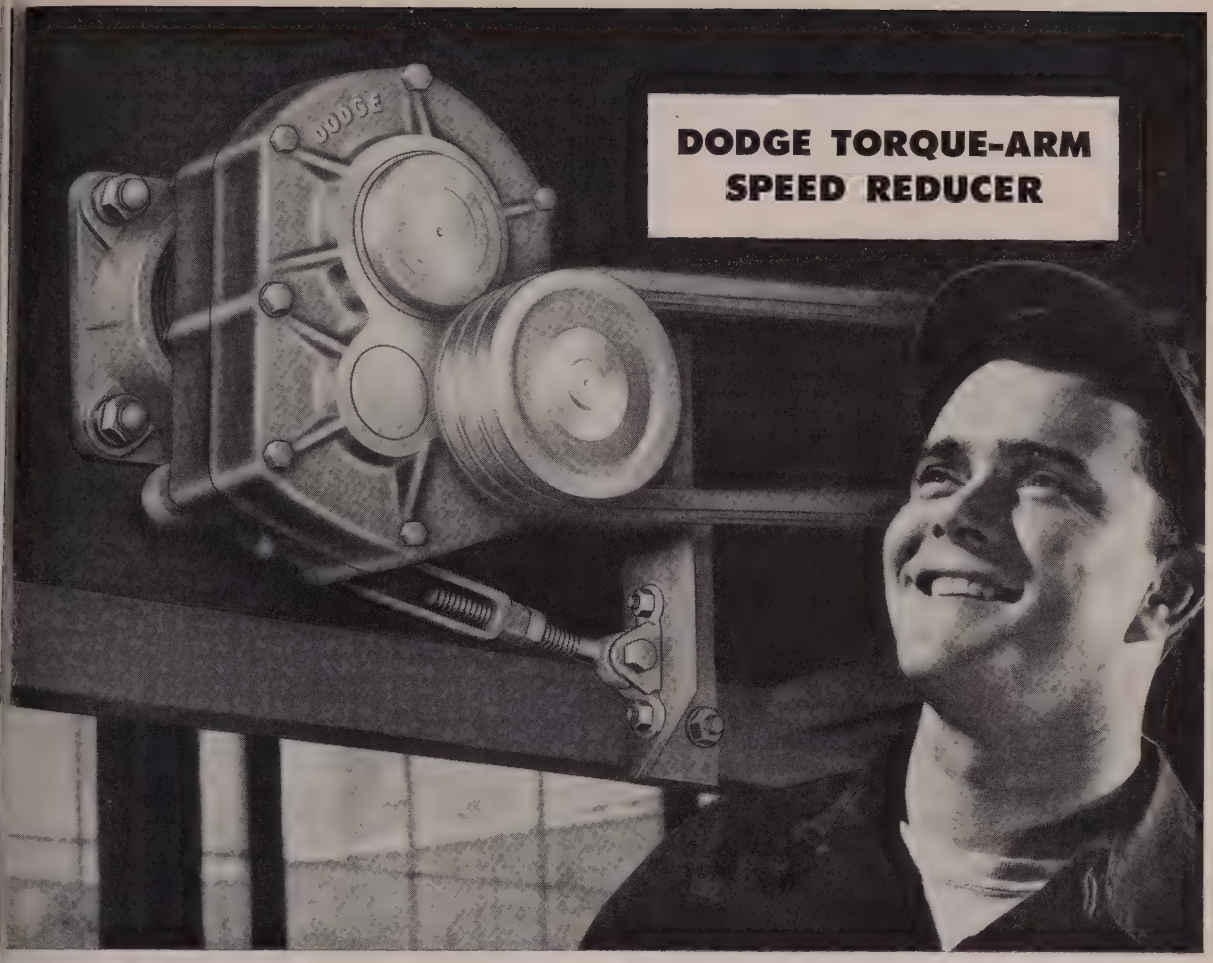

Costs less – Delivers more!

Savings up to 33% . . . efficiency up to 97% . . . are yours with this new and better kind of speed reducer. Proved in tens of thousands of installations, in all types of industry!

This reducer is mounted directly on the driven shaft. No foundation, no flexible couplings, no sliding base required. No lining up difficulties. The torque-arm, fastened to any fixed object, anchors the reducer. Unit is driven through any V-belt drive. Stock Taper-Lock Sheaves prescribed for each job. Tri-Matic Overload Release and Backstop are available if desired.

Torque-Arm Speed Reducers are sold from Distributor's stocks—in single reduction and double reduction series—with capacities from 1 to 43 hp and output speeds from 12 to 330 rpm. Standardize on this modern idea in speed reduction—it saves you money.

DODGE MANUFACTURING CORPORATION, 4400 Union St., Mishawaka, Ind.

DODGE
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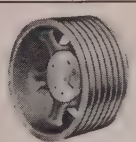
TAPER-LOCK SPROCKETS AND DODGE ROLLER CHAIN


TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

Oil Shale Demonstration Plant, Rife, Colorado

Shostal Press Agency Photo

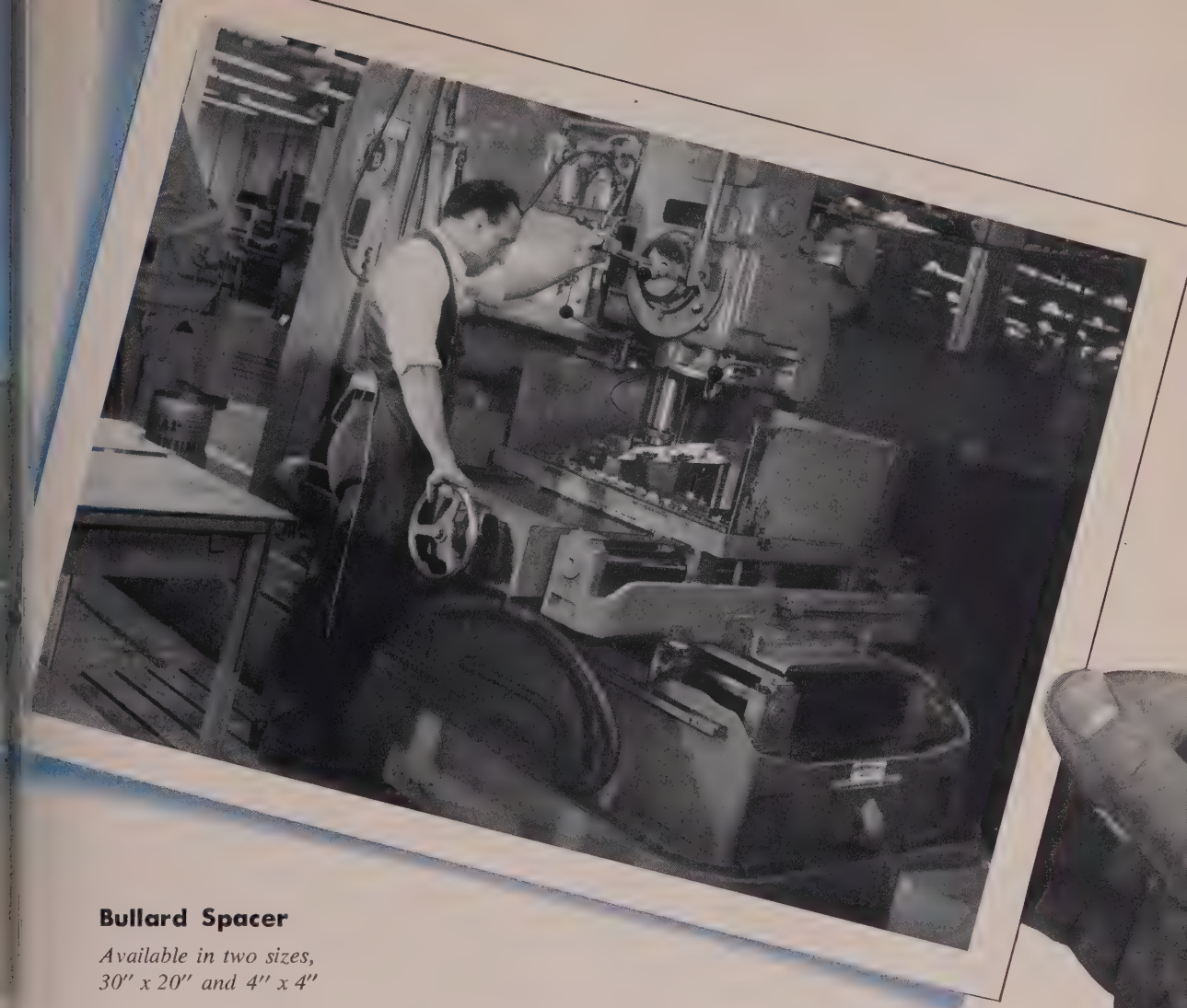
BULLARD

The Invisible Background of Industrial Progress

In 1850 the bulk of work was done by men and draft animals. Only a little more than six per cent of all the energy used in the United States was used by machines. Lacking good lubricants, the machines available were subject to frequent breakdowns. The discovery of oil in 1859 made possible the development of high-speed steam-driven engines and internal combustion engines. As a result, our use of mechanical energy has multiplied 250 fold in nine and a half decades, and now does 90 per cent of the work in this country.

Modern plants, which produce this vital oil, require equipment which is manufactured with *Modern Machine Tools* — another illustration of "The Invisible Background of Industrial Progress."

THE BULLARD COMPANY • BRIDGEPORT 2, CONNECTICUT



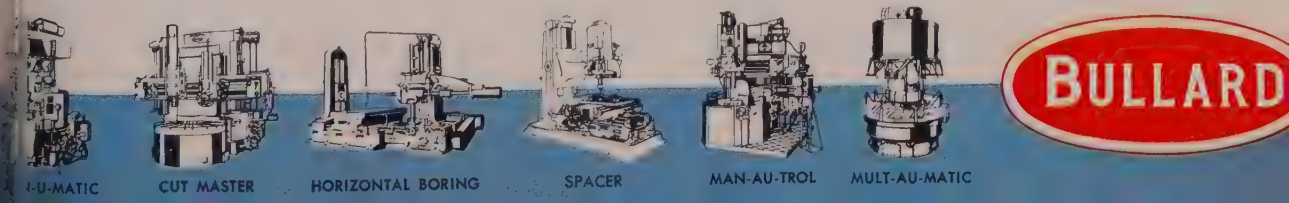
Bullard Spacer

Available in two sizes,
30″ x 20″ and 4″ x 4″

The experience of the Lockheed Aircraft Corporation, Burbank, California, shows the following manufacturing advantages offered by the Bullard Spacer in fabricating a cast aluminum support for the P2 V5 Neptune Anti-Submarine Aircraft.

Automatic spacing
Reduction of set-up time
Greater accuracy — fewer rejects
Elimination of jigs and related costs
Simplified tooling — lower maintenance costs

These factors can be applied to your manufacturing process where accurate and precise drilling, reaming or tapping to exacting standards is required. A Bullard Representative will gladly give you the complete Bullard Spacer story — call him, or write to The Bullard Company, Bridgeport 2, Connecticut — phone 6-2511.



TITANIUM RINGS?

... sure we make them

In 1950 American Welding completed the first successful production flash butt-welding of the new wonder metal — Titanium Alloy. Since that time hundreds of Titanium components have been produced in our plant.

If you use, or are planning to use, fabricated Titanium components, let our Product Development Division study your problem. Our factory is equipped to perform welding, machining, and fabricating of all types of ferrous and non-ferrous metals.

Call or write us today!

THE AMERICAN WELDING & MANUFACTURING COMPANY • 110 DIETZ ROAD WARREN • OHIO

Metalworking Outlook

Steel Strike Insurance?

Steel consumers still aren't buying exceptional tonnages of the metal as strike insurance in case steelworkers walk out June 30. The current ingot rate of 71 per cent of capacity (see p. 161) is the highest since February, but the rise comes almost entirely from normal business improvement. While the odds are still favorable for a peaceful settlement, the union's surprisingly expensive demands, to cost at least 50 cents an hour, led to speculation last week that the June 30 strike deadline might be extended 60 days so deadlocked talks could continue.

Cautious on Walkouts

Big Labor is more cautious about strikes this year than in any other year since World War II ended. In the first four months of 1954, 0.12 per cent of estimated working time in all industries was lost through strikes, compared with 0.18 per cent in the same 1953 period, 0.28 per cent in 1952, 0.21 per cent in 1951 and 0.68 per cent in 1950.

Coming: Freight Rate Skirmish

Another skirmish in the continuing battle over iron and steel freight rates will come by mid-summer. The last round reached a climax Mar. 26 when the Interstate Commerce Commission permitted the railroads to charge up to 20 per cent less on many steel products shipped in the area bounded generally by the Mississippi, Ohio and Potomac rivers and the Atlantic ocean. Truckers protested but decided to wait to see how the new rail charges would affect them. At first the rails' inroads were not great, but in the last month truckers have been losing more business. ICC has ordered an investigation of competitive rates in the area. The first hearing on that matter is slated for July 6, and the truckers will be there.

Sign of the Times

The U.S. is building only 2.1 per cent of the world's total shipping now under construction. The United Kingdom has on order 27.9 per cent of world total ship construction. Not a single ocean-going passenger ship or freighter is being built in the U.S. for private account. American Merchant Marine Institute notes that the current shipping depression has resulted in the layup of about 3.5 million deadweight tons of shipping. The world's total merchant fleet aggregates about 97.6 million tons, with an added 18.6 million tons of new ships on order.

Guided Missiles: $1-Billion Business

Look for increased business from this nation's guided missile program. At least 44 major U.S. industrial and scientific organizations are at work on guided missile prime contracts. At the beginning of the year, those companies held unfilled orders for the weapons totaling more than $1 bil-

lion, says Aircraft Industries Association. The administration has asked Congress to increase the $28.6-billion Defense department appropriation for fiscal 1955 by $1.1 billion, largely for launching sites for guided missiles.

Ike Bats .500

The President will have about a .500 batting average on his legislative requests when Congress adjourns, probably around Aug. 15. He will have won his major points on the tax program; his defense proposals, including the St. Lawrence seaway, will be largely accepted; social security coverage is likely to be extended; more funds for roads have already been approved. On the debit side, Taft-Hartley revisions are virtually dead; flexible farm price supports are unlikely; there's no chance of tariff cuts; the reciprocal trade law will be extended one year, not three.

Water Policy Likely

The President is pushing for a national water resources policy. A committee of the secretaries of Defense, Interior and Agriculture will work with Congress and the nonpartisan National Rivers & Harbors Congress to formulate one. Don't expect any recommendations for federal laws on the subject, although there may be that implied threat. The administration wants to prod state and local governments into more action.

Slow Start

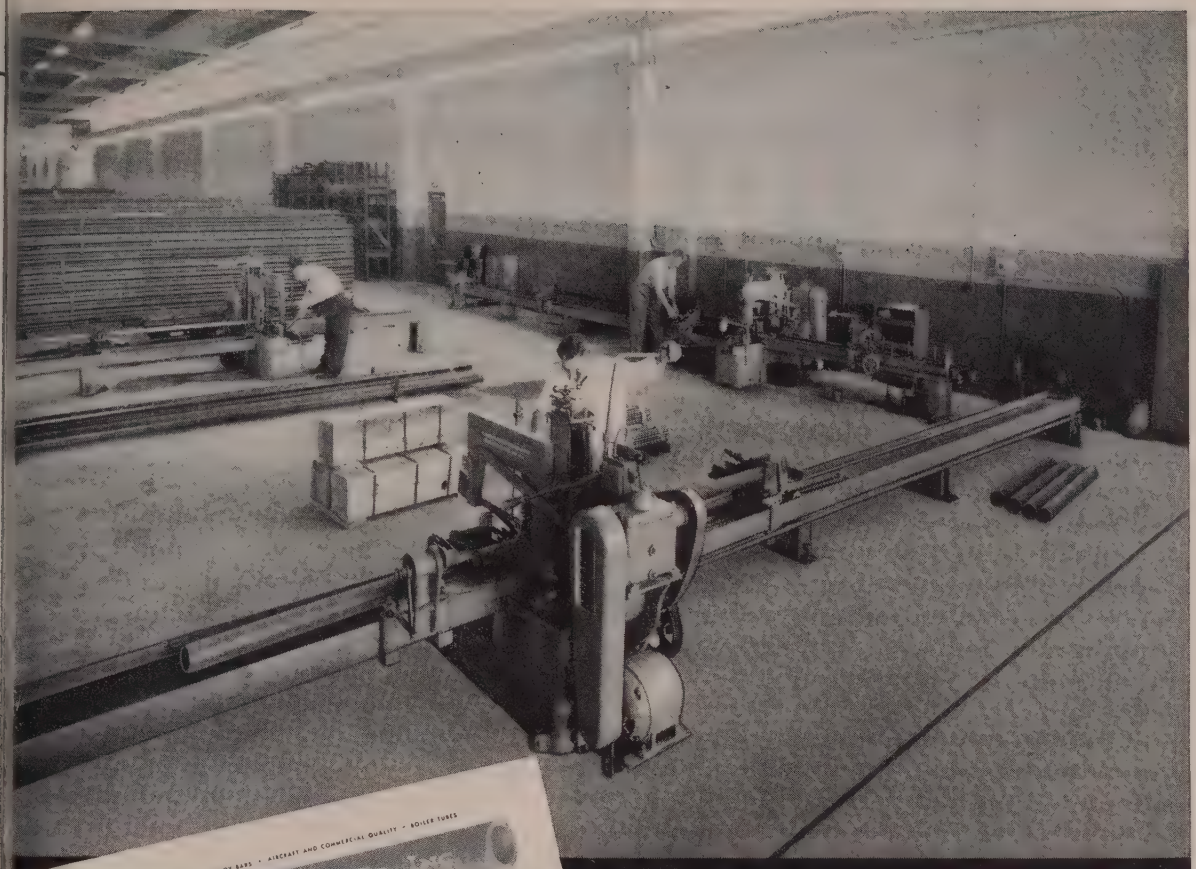
"Sluggish" is the word for the progress the U.S. has made thus far to lure plants to areas of unemployment. An Office of Defense Mobilization report says only 11 companies have indicated an intention to locate new plants or expand production in hard-hit labor areas since the campaign to help those areas started. The proposed new facilities have a total value of $20.7 million and would employ 1639 people.

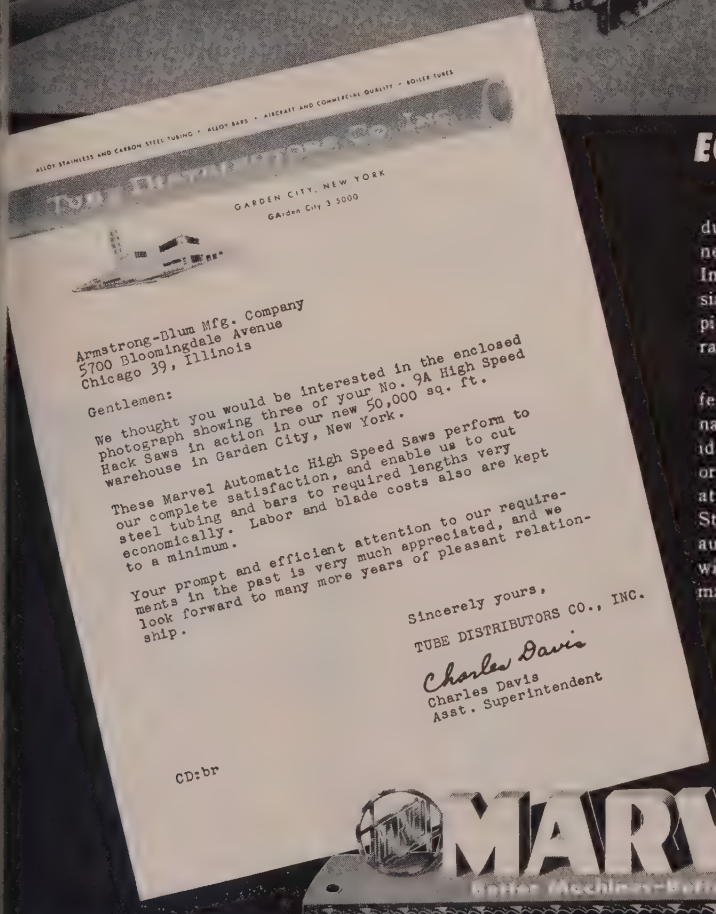
Straws in the Wind

Kaiser Aluminum & Chemical Corp. will spend $1.5 million to expand its Trentwood Works at Spokane, Wash. . . . The Chicago Mercantile Exchange will establish a scrap iron futures market by Aug. 1, despite objections from some scrap men . . . U.S. Steel Corp. is exploring for iron ore in Quebec . . . A proposed ODM plan to mobilize manpower in an emergency will urge voluntary controls . . . Elton Hoyt II, senior partner, Pickands Mather & Co., was awarded the Gary medal by the American Iron & Steel Institute.

This Week in Metalworking

A potential replacement market of $26.7 billion for capital equipment will exist by 1975, predicts Machinery & Allied Products Institute (p. 63) . . . Fit your marketing plans to the growth in metalworking (p. 66) . . . Wrought iron producers are developing new markets (p. 69) . . . Kenilworth Steel Co., a New Jersey warehouse, held its own private metal show (p. 73).





GARDEN CITY, NEW YORK
GArden City 3 5000

Armstrong-Blum Mfg. Company
5700 Bloomingdale Avenue
Chicago 39, Illinois

Gentlemen:

We thought you would be interested in the enclosed photograph showing three of your No. 9A High Speed Hack Saws in action in our new 50,000 sq. ft. warehouse in Garden City, New York.

These Marvel Automatic High Speed Saws perform to our complete satisfaction, and enable us to cut steel tubing and bars to required lengths very economically. Labor and blade costs also are kept to a minimum.

Your prompt and efficient attention to our requirements in the past is very much appreciated, and we look forward to many more years of pleasant relationship.

Sincerely yours,
TUBE DISTRIBUTORS CO., INC.
Charles Davis
Charles Davis
Asst. Superintendent

CD:br

EQUIPPED FOR SERVICE

With the three No. 9A Marvel Heavy-duty Production Saws shown above in their new warehouse, the Tube Distributors Co., Inc. are equipped to give prompt service on single lengths or any quantities of identical pieces for these are the world's fastest, accurate cutting-off machines.

Operating at higher speeds and heavier feeds with blades tensioned tauter than ordinary saws, these saws will cut off accurately identical lengths from single or nested tubes or bars automatically—with no more operator attention than an automatic screw machine. Still, at any point in a "production run", the automatic bar-push-up can be disengaged with the throw of a lever, a miscellaneous cut made, and the "production run" resumed.

Write for Marvel Catalog—
9 types of metal-cutting saws,
capacities 4" x 4" to 24" x 24".

Metal Cutting
MARVEL SAWS
Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 Bloomingdale Avenue • Chicago 39, Illinois

USING SHEET or STRIP STEEL?

Here's where Reliance JOB-FITTING might help you, too

The steel you buy must *make* your job. More than that, the steel must make the job within your cost limits.

But cost limits don't always stay put. Your margin may have become too slim for comfort. Or a customer may be after you to sharpen your pencil. Maybe *his* competitors are sniping at him. Maybe *your* competitors are sniping at you.

Perhaps your way out is to modify your tools and dies, or cut corners in your operations. And there are other ingenious cost-cutting ways known to stampers. But when the steel is a big cost factor, that's where your cost saving opportunities may be.

And, perhaps that's where we might help. Reliance Job-Fitting ways have come up with cost saving opportunities for others. We'd like to try to help you, too.

Let's talk it over anytime you say.

T.M. REG. U.S. AND CANADA

DEPENDABLE DAN will take care of it for you!

Here's the gist of the Reliance JOB-FITTING idea—

. . . It's knowing our "stuff" . . . our "feel for steel."

. . . It's knowing your job . . . what you expect the steel to do for you.

. . . It's supplying in-stock sheet and strip best suited to your immediate need.

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

RELIANCE STEEL DIVISION

Processors and Distributors JOB-FITTED Sheet and Strip Steel

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ROCHESTER 4, N. Y., 5 St. Paul St., BAker 1061
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COLD ROLLED STEEL STRIP — COILS — CUT LENGTHS — ALL TEMPERS
SHEETS: COLD ROLLED — HOT ROLLED — H. R. PICKLED — LONG TERNE — GALVANIZED
Standard and Production Sizes or Cut to Actual Working Dimensions

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PRODUCERS OF

Coke • Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Hot Rolled and Cold Rolled Sheet and Strip
Low and Medium Carbon Manufacturers' Wire
High Carbon Specialty Wire • Welded Fabric

GENERAL OFFICES
DETROIT 9, MICHIGAN

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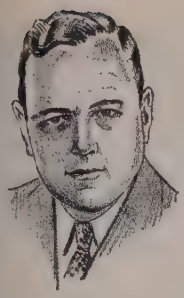


More Growth Ahead

As part of America's biggest industry, you undoubtedly have contributed individually to its accomplishments in the last 15 years. And, the chances are that you will play an even bigger role in the growth that lies ahead.

Many of the things that are happening in metalworking are set forth in a new study and census just completed by this publication. Some of them are:

Since 1939 the total number of U.S. metalworking plants has more than doubled from 27,000 to over 54,000. Most of the gain took place during the war years but, except for a slight dip from 1947 to 1950, growth has been steady. In fact, there has been a net increase of 5000 plants of all sizes since 1950. Among the 24,644 plants employing 20 or more persons, 3679 were added from 1951 through 1953.

If you are market conscious, and you should be, you will find in the new census that more than half of the plants employing 20 or more are concentrated in New York, Ohio, Illinois, Michigan and Pennsylvania. Twenty per cent are in New Jersey, Massachusetts, Indiana, Connecticut and Wisconsin. But, California now is in sixth place right after Pennsylvania, and Texas has moved up to twelfth position. Combined, these two states account for 10 per cent of U.S. metalworking and offer ample evidence of the persistent shift westward in industry.

Measured two ways, metalworking is by far the biggest industry and continues to grow faster than the rest of U.S. industry. In 1947, metalworking had 41 per cent of 15.2 million manufacturing employees. In 1952, it had 46 per cent of 17.1 million. Value added by manufacture rose from 39 per cent of $74.4 billion in 1947 to 46 per cent of $108.4 billion in 1952.

Based on a population of 180 million in 1960, metalworking sales are expected to be $141 billion, up from a record $125.3 billion in 1953. For your share of this growing market, it's your job to determine what will sell competitively, how to sell it and where to sell it. Modern market research is finding the answers.

Irwin H. Such

EDITOR

BIG MARKET: Machinery & Allied Products Institute has come up with a new study forecasting statistically a bright future for the capital equipment replacement market and an only slightly less rosy future for plant replacements.

Equipment replacements, predicts MAPI, will rise from $10.4 billion in 1954 to $15 billion in

1960 and $26.7 billion in 1975. This is predicated upon stocks of equipment over ten years old increasing from $60 billion at present to $100 billion in 1960 and almost $200 billion in 1975.

Plant replacements are expected to go from $4.1 billion in 1954 to $4.5 billion in 1960 and $5.8 billion in 1975. Present $100-billion inventory of plants over 30 years old is expected to be $120 billion in 1960, but drop back to $100-billion in 1975.

Plants have a considerably longer service life than equipment, and future replacement is affected by the comparatively low level of construction after the war. But, MAPI thinks there may be more expansion demand for plants than for equipment. Anyway you look at it, there's a lot of business ahead for metalworking.

* * *

ON THE UPGRADE: Immediate business prospects, while not as rosy as those for the longer pull, are moderately improved. June business promises to be better than May volume (p. 81). Jobless aid claims continue to taper off. More people are being hired or called back to work than are being laid off. Steelworks operations are edging upward (p. 161).

Although July should bring a slight recession as many metalworking plants close for vacations, late summer should witness resumption of a modest upward trend.

A spot check of metalworking executives by the Editors of STEEL shows that 66 per cent expect their companies' dollar volume will be greater in the second half than in the first six months. Only 18 per cent expect a lower volume, and 16 per cent expect second-half volume will be unchanged from the first half.

* * *

SHOWMANSHIP PAYS: It often has been said that everyone likes a good show, and that's pretty much evident by the billions of dollars U.S. citizens spend on entertainment each year. So, it's not surprising that good showmanship also will pay off in business.

That's what happened in the case of President John G. Berry of the Kenilworth Steel Co. in Northern New Jersey. Mr. Berry (p. 73) decided to invite his customers and friends to participate in a week-long clinic to stimulate thinking and planning. He had some extra space in his warehouse, so 30 manufacturers of supplies and equipment accepted invitations to display their wares. On hand also were top executives of steel and metal companies to visit and answer questions.

For Mr. Berry's customers, the show paid off in new ideas and closer acquaintance with their suppliers. For Mr. Berry, it is paying off in sales!

* * *

TITANIUM FOR CIVILIANS: Concluded in this issue of STEEL (p. 136) is a series of five articles on the properties and fabrication of titanium. Long regarded as a curiosity, it now is emerging as a commercial metal. Production capacity has been increased several times. Part of each month's production is being set aside for civilian use. Improvements have been made only recently in alloying. Prices are edging downward. It combines lightness, strength and corrosion resistance and fits in between aluminum and stainless steel.

By following a few basic rules and with the proper equipment, it can be fabricated economically into parts and components for civilian products. Its possibilities are well worth exploring.

* * *

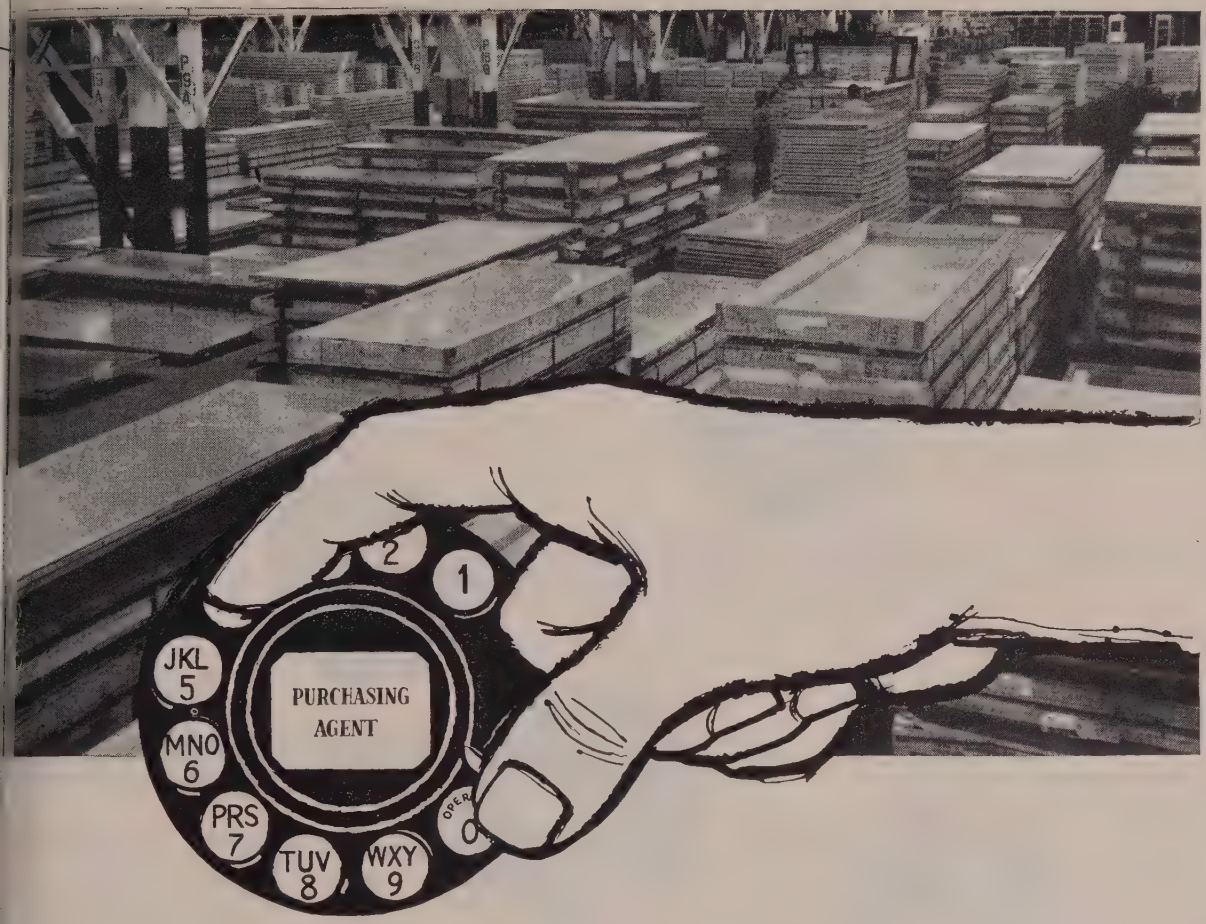
BILLIONS FOR STEEL: Chairman Ernest T. Weir of National Steel Corp. warns that the steel industry is confronted with financial requirements in the years immediately ahead that are heavier than anything in previous experience.

He thinks that present capacity of 124 million tons will have to be replaced entirely within 30 years at a conservatively estimated cost of $30 billion. The job is one of finding $1 billion a year for this purpose or $400 million more than was provided for depreciation and depletion in 1953.

Mr. Weir believes that it is an absolute certainty that the industry will be increasing capacity again and before long. Population is steadily increasing and per-capita consumption of steel likewise is increasing.

Replacement plus expansion means a huge flow of business for those who supply the steel industry. But, as Mr. Weir points out, the industry is going to need money and lots of it. Some of the money must come from earnings, but there also must be an influx of new money.

Mr. Weir believes the investor has been the forgotten man of the steel industry and he must not be any longer. Few will disagree with Mr. Weir's contention that it is up to steel management to establish the industry as one that merits the confidence of the investor.



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that we have adequate sources of our own raw materials

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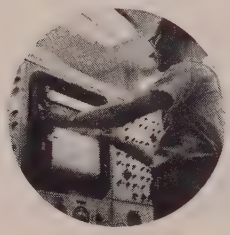
or a battery of blast furnaces and open hearths to produce high-quality steel ingots or a diversified family of rolling and finishing mills to convert them into a great variety of steel mill products

or modern laboratories for controlling steel quality



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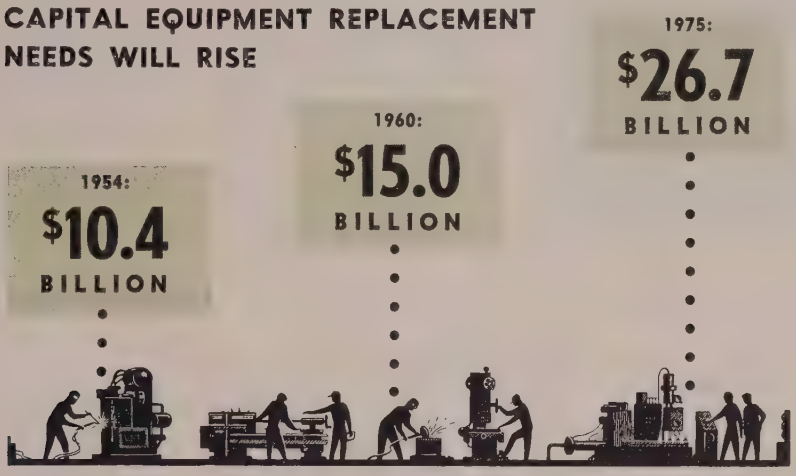


Older Machines Mean Bigger Sales

The replacement potential for capital equipment should grow from $10.4 billion this year to $26.7 billion in 1975. That adds up to a bright outlook, even without expansions

SALES OUTLOOK for capital equipment in the next decade or two is terrific, based on the replacement market alone.

According to a study prepared by the Machinery & Allied Products Institute, the replacement potential for industry's equipment will amount to $15 billion in 1960 and $26.7 billion in 1975 computed on 1953 prices (see the chart).

Another Story—Even that does not tell the whole tale of the capital equipment sales outlook. Besides the replacements, there is an ever-growing expansion market. Each year industry and business have increased their stock of equipment on hand at an historical growth rate of 3 per cent per annum compounded.

Thus the stock of equipment over 10 years of age will rise continuously from a little over $60 billion at present to more than $100 billion in 1960 and almost $200 billion in 1975, more than three times the present amount.

Good, Good, Good—Considering only the retirement of capital equipment, MAPI concludes "the prospective trend of replacement demand is much better for equipment than for plant. In this respect the equipment outlook is in fact extraordinarily good."

In arriving at that outlook, MAPI made a detailed analysis of the age composition of the stock of business capital goods. Beginning in 1920, the percentage of business equipment in the "10 years old and under" age bracket amounted to about 62 per cent; in 1940, it amounted to about 52 per cent; in 1954, it amounts to about 75 per cent; and the estimated trendline shows the percentage going back to about the 62 or 64 per cent mark again by 1975.

How Come?—Since MAPI estimates that 80 per cent of the replacements in equipment occur after 10 years of use, this decrease in the "10 years and under" bracket and converse increase in the "over 10 years" bracket shows where the larger replacement market is coming from.

Caution should be used in interpolating the outlook for a particular kind of capital equipment into the estimates given above. However, data released by the Office of Business Economics, Commerce department, give the sales trends for major product groups in the recent past. OBE figures show machinery purchases, among major groups of capital equipment, gained the most as a percentage of total equipment sales between 1929 and 1952—48 per cent in 1929 compared with 58 per cent in 1952; transportation equipment sales lost ground during the same period—39 per cent compared with 32 per cent; and other equipment (business furniture, instruments, and fabricated metal products) slipped, too—13 per cent to 10 per cent.

Fine-Toothed Comb — If you shred the classifications of capital equipment even finer and consider actual dollar sales, electrical machinery, instruments, tractors, construction machinery, mining and oil field machinery, and metalworking machinery all had actual dollar purchases which were at least five times the 1929 level in 1952. Purchases of ships and boats, railroad equipment, business furniture and fixtures, fabri-

cated metal products and miscellaneous equipment were between two and three times the 1929 level in 1952.

MAPI makes two main reservations in promulgating its report. One is that over-all figures on the age distribution of stocks of business equipment do not exist. This study is based on data relating to limited classes of capital equipment. Secondly, the future estimates of capital equipment replacement are based on survival curves obtained from historical samples. These historic patterns could be disturbed by any great national emergency.

Railroads Report Steel Buying

Iron and steel purchases by the nation's Class I railroads amounted to more than $612 million in 1953, says the Association of American Railroads.

Steel rail for replacement, largest single item, accounted for more than $120 million (20 per cent of the total expenditures in this category). This sum was up 55 per cent over 1952.

Purchases of track fastenings, bolts and spikes vied with buying of locomotive and car castings for the second-highest-amount spot. Slightly less than $90 million was spent on each of these types of purchases in 1953.

In addition to these sums spent for various materials required in operations, railroads invested $1,260,000,000 in new plant, equipment and facilities in 1953.

House Bill Points at Autos

"One-way" contracts between automobile manufacturers and their dealers and farm machinery manufacturers and their dealers would be outlawed under a House bill to be introduced by Rep. J. L. Whitten (Dem., Miss.). It would be an unfair practice for a manufacturer, in granting distribution rights to a dealer, to require the dealer to accept goods not specifically ordered. The bill also would make it unlawful for a manufacturer to withdraw a franchise from a retail dealer refusing to accept shipments exceeding his needs.

The bill is general in character, applying to all products. But Rep. Whitten says he has automobiles and farm machinery particularly in mind. In explaining his reasons for the bill, Rep. Whitten said, "One of the major automobile manufactures broke every one of his dealers, of whom I knew, in my state in that (1953) period by loading on such dealers automobiles which the dealer could not sell at reasonable terms."

Bright Future for Enamelers

Expanding markets and good business were predicted at the mid-year conference of Porcelain Enamel Institute.

"The outlook for general enameling in 1954 looks good," says W. H. Lowry, Vitreous Steel Products Works. Americans are spending about $15 billion a year on home goods, and about $3 billion of this is for appliances. "That spells porcelain enameling."

Clothes dryers and porcelain enamel (so-called glass-lined) hot water heater tanks are about the "hottest" things in the enamelers' order books right now.

The longer-range view is also good, according to F. C. Woleslagle, U. S. Steel Corp. He estimates that production of porcelain enamel will top $2.75 billion during the next seven years.

Copper Research Stepped Up

Copper and brass industry is getting under way a stepped-up research and promotion program to extend and emphasize the role of copper and its alloys in industry, reports Copper & Brass Research Association.

Increasing availability of copper and ample capacity of copper and brass mills is lending impetus to the move.

Richard C. Diehl, president of Chase Brass & Copper Co. Inc., Waterbury, Conn., was re-elected

Steel Improvement Buys Champion's Forge Division

STEEL IMPROVEMENT & Forge Co., Cleveland, became one of the nation's largest commercial forge shops with the purchase of Champion Forge division, Champion Industries Inc., also of Cleveland.

Both companies are aircraft industry suppliers and pioneered in forging aircraft parts. By using Champion Forge's heavy equipment, Steel Improvement will be able to supply the wide range of forged components needed by the aviation industry. Forgings weighing as much as a ton can be handled by the 35,000-pound steam hammers at Champion.

More Space—Lack of space for large hammers was one of the reasons given for the purchase by Charles H. Smith, president of Steel Improvement. Champion's equipment includes two 35,000-pound and three 25,000-pound steam hammers, plus smaller steam and drop hammers and all other forging equipment needed for die sinking, heat treating, metallurgical inspection and testing.

The Champion property adds 225,000 square feet of manufacturing area to Steel Improvement's original 200,000 square feet.

Mr. Smith also announced that Steel Improvement sold its subsidiary, Canadian Improvement Ltd. at Etobicoke, Ont., to an English firm, High Duty Alloys Ltd.

DIE FOR AIRCRAFT LANDING GEAR *. . . at new Steel Improvement division*

resident of the association at s annual meeting.

ax Write-off for Titanium

Mallory-Sharon Titanium Corp., Niles, O., received the largest fast ax write-off awarded in the two weeks ended May 19. The award was for titanium facilities, $3,986,-114 with 90 per cent allowed.

Jones & Laughlin Steel Corp., Pittsburgh, received the second largest certificate, $1,565,980 with 80 per cent allowed, for research and development of steel products.

Thirty-one certificates amounting to $9,401,309 were awarded during the period.

Canned Soda—A Potential

New York consumer test may open a $250-million market for equipment makers

A POTENTIAL $250-million market looms for producers of can-making equipment.

That's the minimum expenditure that would be necessary by containermakers to meet an annual 13-billion-can market in the soft drink industry, says William C. Stolk, president, American Can Co.

The Test—If the consumer is willing to pay extra for his soda pop in cans rather than in bottles, the 13-billion-can market is a possibility, Mr. Stolk states—that's twice the annual number of cans used by the beer industry today. Test of the consumer's willingness is now under way in New York City. Hoffman Beverage Co., New York, subsidiary of Pabst Brewing Co., is marketing a cola drink in cans made by American Can.

Metal cans cost soda pop processors about 3 cents each, Mr. Stolk says. That's probably 2 cents more than glass containers which can be used over and over as many as 80 times. It's obvious, the can company president says, that the market will depend entirely upon consumer acceptance.

Onlookers — American Can has had a can for soft drinks under development since 1937, but it has not offered it in any volume until Hoffman decided to run the test. If successful, the test could draw the "big five" of the soft drink industry into the field.

What's This Talk About Large Steel Earnings?

How Steel Net Earnings Compare with Other Manufacturing

(Percentage of Net Profit to Net Worth)

Year	Highest Industry	Average all Industries	Iron and Steel	Lowest Industry
1928	27.7	11.6	7.0	—1.2
1929	27.1	12.8	11.2	—5.6
1930	23.6	6.4	4.5	—7.2
1931	18.0	2.3	—0.5	—10.0
1932	13.4	—0.5	—4.0	—10.4
1933	12.3	2.5	—1.9	—4.0
1934	21.7	4.3	—0.4	—7.2
1935	21.5	6.7	1.3	2.8
1936	25.7	10.4	4.7	3.7
1937	38.5	10.8	6.9	—0.9
1938	36.6	4.8	—0.2	—9.5
1939	37.5	8.5	4.5	2.2
1940	33.9	10.3	8.5	4.6
1941	48.8	12.4	9.6	5.7
1942	45.0	10.1	6.5	6.5
1943	36.8	9.9	5.6	4.0
1944	23.6	9.8	5.2	1.8
1945	22.2	9.3	5.1	2.6
1946	41.6	12.1	7.4	4.8
1947	34.8	17.1	11.3	—6.0
1948	31.5	18.9	14.0	3.1
1949	30.2	13.9	11.6	3.0
1950	32.3	17.1	15.3	—1.8
1951	19.9	14.4	12.3	4.7
1952	18.7	12.3	8.8	—3.5
1953	21.0	12.5	11.6	—4.6

Source: National City Bank of New York

STEEL EARNINGS—are they great enough to maintain investor confidence? "No," Ernest T. Weir, chairman, National Steel Corp., said at the annual meeting of the American Iron & Steel Institute (see STEEL, May 31, p. 48). Only once, in 1953, (see table) did steel earnings come within 1 percentage point of the all-industry average in the past 26 years. Estimating that $1 billion will be needed annually for the next 30 years just to maintain present plant and facilities, Mr. Weir emphasized that steel has an obligation to make fair earnings and pay fair dividends on a dependable, regular basis in order to obtain funds to maintain and expand its plant. The cost of this obligation must be shared by the consumers of steel.

FIT YOUR SALES TO GROWING MARKETS . . .

BY WHATEVER yardstick used, metalworking is one of the nation's most dynamic industries.

For companies selling equipment and supplies to metalworking, the market potential is tremendous. Key to taking advantage of this potential lies in tailoring your sales efforts to this growing market.

The Potential—Saleswise (see top chart on page 67) dollar volume has more than doubled since 1947. Projections based on population forecasts of 180 million persons in 1960 and 200 million in 1975 peg the market potential between $156 billion and a possible $337.8 billion by 1975. The lower figure is based on a constant level of per capita consumption; the higher figure is based on a $41-per-year increase in per capita consumption—the average increase since 1947.

Two factors point out the growing importance of metalworking compared to all other industry. 1. Total value added by manufacture by metalworking increased from 39 per cent in 1947 to 46 per cent in 1952. 2. In 1939 metalworking employed 31 per cent of all persons working in manufacturing; in 1953 metalworking's 7.8 million employees represented 46 per cent of those employed in all manufacturing.

Top 12—These are statistics pointed out in STEEL's research department's latest guide, "Metalworking Markets in the U. S." It's based on STEEL's continuing census of 24,644 metalworking plants employing 20 or more persons. The top 12 states, according to number of plants, are, in order: New York, Ohio, Illinois, Michigan, Pennsylvania, California, New Jersey, Massachusetts, Indiana, Connecticut, Wisconsin and Texas. Together they represent over 82 per cent of the plants in the nation.

Texas has replaced Missouri in the top 12 metalworking states because of its increasing operations. It now stands eighth in structural and plate fabrication, ninth in smelting and refining, and tenth in rolling operations.

Concentration—Effective sales programs are based on market concentration. The greatest concentration of markets, according to operations performed, is shown in the table on page 67.

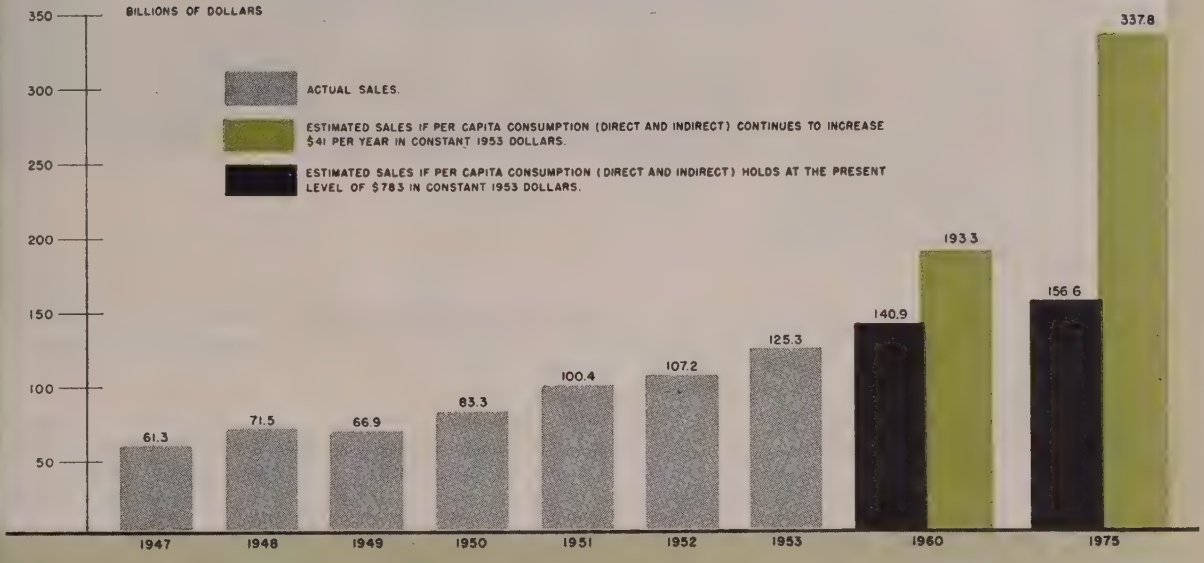
OVER 25,000 MAN-HOURS went into the production of STEEL's sales planning guide, "Metalworking Markets in the U.S." The guide gives a complete analysis by state and leading counties and by U.S. Standard Industrial Classification code numbers of the nation's 24,644 metalworking plants employing 20 or more persons. A 24-page digest, "Analysis of U.S. Metalworking," is available to STEEL's readers upon request.

Where Are Your Markets?

Geographic Location of Metalworking Plants Employing 20 or More

State	Plants
1. New York	3,307
2. Ohio	2,952
3. Illinois	2,536
4. Michigan	2,321
5. Pennsylvania	1,947
6. California	1,844
7. New Jersey	1,230
8. Massachusetts	1,042
9. Indiana	910
10. Connecticut	885
11. Wisconsin	834
12. Texas	595
13. Missouri	509
14. Minnesota	364
15. Maryland	334
16. Iowa	260
17. Tennessee	225
18. Rhode Island	202
19. Alabama	188
20. Washington	171
21. Kentucky	167
22. Georgia	159
23. Virginia	158
24. Oregon	140
25. North Carolina	139
26. Oklahoma	137
27. West Virginia	123
28. Colorado	119
29. Kansas	116
30. Florida	109
31. Louisiana	92
32. Nebraska	72
33. New Hampshire	72
34. Vermont	49
35. Maine	48
36. Utah	46
37. Delaware	42
38. Mississippi	42
39. Arkansas	35
40. South Carolina	33
41. Arizona	22
42. Dist. of Columbia	19
43. Montana	12
44. Idaho	11
45. South Dakota	9
46. New Mexico	6
47. North Dakota	5
48. Wyoming	4
49. Nevada	2
U. S. Total	24,644

Metalworking's Sales Volume Has Doubled Since 1947



EQUIPMENT AND SUPPLIES MARKETS:

Here's Where Metalworking Operations are Concentrated

By Number of Plants in Leading States

Operation	N. Y.	Ohio	Ill.	Mich.	Pa.	Calif.	N. J.	Mass.	Conn.	Wis.	Ind.
Machining	2300	2005	1663	1625	1356	1234	900	739	629	581	573
Casting	395	483	354	295	421	261	160	164	120	168	185
Die Casting (pressure)	96	101	117	91	63	72	48	34	44	26	40
Forging	198	237	182	127	246	111	83	104	75	54	66
Heat Treating, Annealing	935	799	632	570	635	386	331	365	336	199	258
Stamping, Drawing, Blanking	1658	1158	1261	891	695	696	501	443	445	358	407
Other Sheet Metal Work	1154	820	734	598	528	657	328	324	216	276	308
Plate, Structural Fabrication	530	560	438	406	490	462	254	181	90	217	155
Welding (arc, gas)	1429	1378	1048	1007	989	985	514	469	273	448	447
Welding (Resistance spot, flash)	1143	946	898	690	585	585	414	317	266	304	314
Pickling	468	354	324	243	280	182	149	160	173	83	122
Metal Washing, Degreasing	1208	921	833	703	536	517	340	367	348	295	338
Sand or Shot Blasting	516	518	419	374	460	280	159	214	157	177	183
Electroplating	530	353	330	259	219	174	195	174	213	84	111
Galvanizing or Tinning	120	117	101	64	106	71	54	70	33	38	48
Buffing or Polishing	1100	725	701	514	495	447	332	357	325	225	241
Porcelain Enameling	40	53	47	31	41	24	12	21	10	14	23
Lacquering, Enameling or Painting	1064	759	749	514	515	502	322	289	288	263	294
Assembly of Product	2252	1672	1652	1248	1141	1223	764	664	573	541	546
Smelting and Refining	40	52	36	20	54	34	20	12	7	7	16
Rolling	122	117	81	75	116	92	51	47	50	21	38

INDUSTRY GOES TO COLLEGE for conferences on problems

A CONFERENCE might be defined as a group of people bumping their heads together. But more than lumps result when industry and university men get their heads together, say enthusiastic college-industry conferees.

Statistics on the growth of college-industry conferences are scanty because of the phenomenal postwar growth of such activities. Most schools report their conference activity has doubled or tripled since the war's end, cite increasingly rapid technological progress as one key factor in the spread.

Timely Topics — Carnegie Tech, for example, has a series of conferences at which member companies receive reports on results of college research. Some of the larger companies co-operating in the program ante in $50,000 per year, hear reports on topics such as "Rates of Chemical and Metallurgical Processes," "Turbulence in Fluid Flow," and "Elastic-Plastic Behavior of Structures and Machine Parts."

And these are but a few of the tidbits covered in the "regular and scheduled information service reporting to co-operating companies upon the results of current fundamental research." Initiated at the college in 1951, the plan is being used by more institutions every year.

Human Aspects—Less technical is the Foreman Training Program conducted by the University of Michigan. Here foremen annually are given a capsule lecture on the human relations aspects of industry, form into work groups with individual problems to solve hypothetically. The solutions are then discussed to illustrate correct principles of procedure.

Conferences of this type may actually extend into short courses in specific or general areas. The U of M offers a course in executive development, for example, which runs for one month for men just below the general management level. Topics considered include such matters as accounting, economics of enterprise, financial administration, production and marketing management.

Applying Theory—Case Tech in Cleveland has both courses and conferences on Operations Research, the application of scientific methods to policy problems. The conferences bring both industry and college spokesmen to the rostrum during the morning sessions, reserve afternoon periods for discussion of specific questions and problems in the field.

The Case program brings out several points in connection with conferences which are significant. Conferences can be called (and have) on any subject from "TV Preaching Techniques for Ministers" to "Aircraft Icing." But the conference to be effective must not merely be a lecture session. Discussion periods and a timely topic are considered the two basic factors by Dr. Jay Oatis of Western Reserve University. "We try to keep conferences narrow enough," he says, "so people attending will go back with a new skill."

Two-Way Street — Pinpointed here is much of the philosophy behind the growth in conferences. For colleges they provide an opportunity to educate the college personnel concerning new developments in fields of industry and business. By the same token, industry men are kept up-to-date in their fields through spending a few days or a week back on campus. Equally important to both groups, researchers and men in industry have an opportunity to guide one another in problems that exist and how those problems may be solved.

This is the third and final article in a series (others appeared Mar. 15, p. 68, and Apr. 26, p. 66) in which STEEL has considered the college-industry relationship. In research, in the training of personnel and in the consideration of mutual problems through conferences, there is a vital and growing link between the colleges and industry. Much of the stream of knowledge upon which industry progress is predicated flows from the reservoir of the nation's schools.

That's why more companies every day are taking steps to see that the reservoir grows and that the flow to their firm is not blocked.

lew Life for Oldest Ferrous Metal

Producers of wrought iron are finding new markets for the metal with a 5000-year history. Younger metals are flashy, but wrought iron has durability and anticorrosive qualities

ROUGHT IRON is fighting for w markets.

Producers believe the winning ttle strategy will be found in plaining the characteristics of e material to the metalworking ade; advising architects, engi- ers, and metalworkers where rought iron can best be used; d demonstrating its durability to rrosion and fatigue stresses.

Going To Work—Putting in ac- n an aggressive education and les program on wrought iron, B. . Byers, vice president in charge sales, A. M. Byers Co., Pitts- rgh, reports: "We are carrying t a jobbers' education program signed to better educate distrib- ors on qualities of the metal. To that, we have developed a com- ete Jobbers' Aid Program, includ- g use of films, slides, imprinted erature, co-operative advertising, formative displays, and practi- lly everything the jobber might ed for his own sales promotion ogram."

Less than 10 American compa- es produce wrought iron with to- l output hovering around 150,000 ns annually. Most of that is oduced by Byers. Industrial uses ill account for the largest per- ntage of wrought iron tonnage les. Applications include steam pply and return lines, water lines, ainage systems, processing lines, d underground services. Much the "wrought iron" furniture en- ying a vogue today is actually ade of low-carbon steel.

Wider Applications — Objective missionary work in wrought iron to establish new markets to take e place of old ones now past their ime. For example, Lockhart Iron Steel Co., Pittsburgh, admits at transition from steam to die- l locomotives has cut railroad quirements for wrought iron. But, it adds, new railroad uses are taking up some of the slack. New applications include bars for spacing ties, car-thawing devices and air brake piping.

Wrought iron is being used in air-conditioning systems and in refrigeration process equipment where ammonia or corrosive waters are used. Construction of indoor ice skating rinks requires wrought iron in piping.

Admirable Quality — Its resistance to corrosion causes the material to be used in hulls of barges, pier piping and sewage lines, say Byers officials. Snow melting systems use wrought iron pipe and more than 200 tons of the metal pipe are being used to heat access ramps of Boston's Aerial Highway, now under construction.

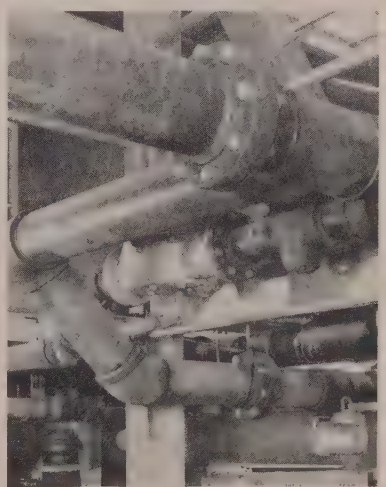
Another new application of wrought iron is in cold-drawn tubing, a wrought iron pipe cold drawn to exacting specifications. A large midwestern manufacturer of electrical equipment uses the tubing in building heat exchangers and condensers.

Chemically Speaking—The metal that fits all these varied applications so well consists of high purity iron and uniformly distributed fibers of iron silicate in physical association without fusion. Iron silicate content averages only 2.5 per cent of wrought iron's weight, but as many as 250,000 of the siliceous fibers may be found in a cross-sectional square inch.

Competition from younger metals may limit wrought iron's scope, producers concede. But the present battle is not one of survival; rather it's an effort to further broaden the market base. As Byers puts it: "There are more applications of wrought iron today than ever before, and we intend to improve on that situation."

Key operation in making wrought iron is pouring molten refined iron into a bath of liquid slag, forming a ball

White hot, sponge-like ball is dumped on the platform of a heavy press which will squeeze it into a bloom



A. M. Byers Co.

Typical application — much wrought iron is used for piping corrosive fluids and in corrosive atmospheres

Labor Unions Are Crossing Over to Business' Side of the Stree

NEWS of the UAW-CIO Local 12's offer to take over wholesale distribution of Kaiser and Willys motor vehicles in Ohio (see STEEL, May 24, p. 47) struck Washington labor circles like a bombshell.

Labor spokesmen could not recall any previous case where a union has proposed to engage in big-time competitive business. The departure is all the more impressive because local 12 offered to launch a sales agency in Toledo, O., to push distribution of the particular product of its members in competition with those of other locals belonging to the same international union.

Threatening Move — First thought of some Washington labor officials is that this move threatens the present exemption of labor unions from income tax liability, based on the theory that income of unions is mostly in the form of dues from members. If unions get into private competitive enterprise, these men reason, that old justification would be knocked out since the unions would be earning profits from their business venture.

Second thoughts of the Washington labor officials revolve around the more immediate question: Does the move of the Toledo, O., UAW local signal the beginning of a large scale invasion in competitive enterprises by other unions?

Looking for Outlets . . .

The fact is that many unions have accumulated large cash reserves and are increasingly perturbed over what to do with them. After acquisition of real estate, office buildings, the operation of insurance companies and the buying of government bonds, these unions have taken increasingly to investing in trusts and industrial securities.

Furthermore, many unions increasingly have conducted their activities in the interest of employers with whom they have contracts. These programs have been designed largely to help employers maintain stable employment. However, the effect has been to make more and more union leaders intimately aware of the problems of conducting a business.

These conditions suggest that a business career is a definite possibility ahead for more labor unions. Cases from recent history of the labor movement show how the trend may develop.

Laborer, Salesman, Chief . . .

When the machinists' union launched a newspaper, TV, and radio drive last Christmas to promote sales of Schick electric razors, it had in mind the large unsold stock of Schick razors and the threat of a protracted layoff of employees unless those stocks were sold. The effort paid off; the razors were sold and there was no layoff.

In a different approach, Dave Beck, Teamsters union head, recently was selected as chairman of a joint committee of truck manufacturers, truckers and teamsters, created in Washington to wage the battle between trucks and other forms of freight transportation.

In 1953, Mr. Beck's union loaned about $1 million to Fruehauf Trailer Co. to enable the incumbent management to accumulate enough Fruehauf stock to continue in power.

Another interesting example of what happens when union leaders have business experience is the career of John L. Lewis in the banking business. He was so impressed with the success of the UMW-owned National Bank of Washington that he has taken steps to merge with it the Hamilton National Bank—a move which would make him the number-two banker in the nation's capital. What Mr. Lewis learned is that the unfortunate experiences of some other unions in the banking field were due to operation of those banks by untrained union men. Lewis' big banking operation is run by trained bankers —who are well paid for their services.

Desirable By-Products . . .

One Washington union spokesman told STEEL that the salvation of the private enterprise system may well depend on indoctrinating more union leaders with a better understanding of what makes the wheels go around in business.

"Along this line," he said, "one of the best things American employers can do is encourage unions to set up local co-operatives. . . They—and the union members and their wives—emerge with a better understanding of business and what it takes."

Traveloader®
replaces 3 trucks and releases 6 men for other work

● A Traveloader is used by Kyle-Taylor Lumber Company, Berwick, La., to transport pipe from river dock to storage. It has replaced two pipe trailers and a gin-pole truck formerly used on this job, reduced man-power required from 15 to 9 and made time savings of about 70%.

This company, serving oil producers, receives pipe in barges at the river dock. A truck crane unloads and places the pipe on the dock. The Traveloader picks it up five lengths at a time, transports it to the storage yard, and stacks it neatly on racks for further disposition.

Time studies reveal the speed with which Traveloader works. Loading time at dock averages 35 seconds. Hauling to storage, stacking and returning to dock (round trip .55 miles) averages 3 minutes 8 seconds. The stacking part of this operation takes only 24 seconds! As a result the crane at the dock never has to wait for the Traveloader.

Since the company operates 24 hours, 7 days per week, the cost savings are substantial. Moreover, 6 more workers were made available without increasing payroll, and two less mechanized units require maintenance. "This machine is by far the finest that I have seen for handling pipe. It has doubled our capacity with less labor," says Mr. J. E. Kyle, Jr., Vice President.

Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck. The Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

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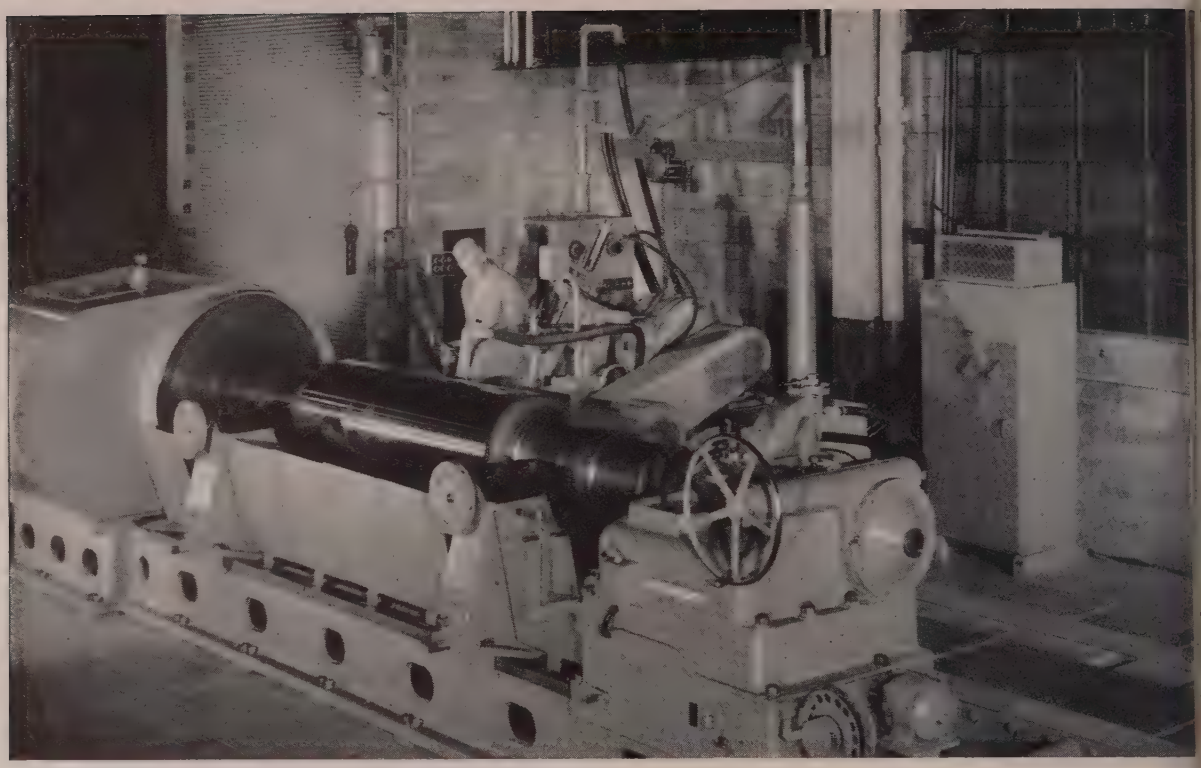

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length between centers	up to 24 ft.
infinite work speeds	36"—9 to 32 rpm
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	50"—7 to 25 rpm
	60"—6 to 21 rpm
infinite carriage traverse rates	¾" to 75" per min.
power rapid cross traverse	20" per min.
motor drives: wheelhead	30 to 40 hp
headstock	up to 30 hp
wheel carriage	1½ hp

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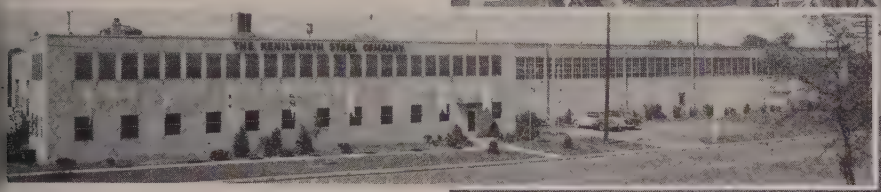


New Ideas Stimulate New Sales

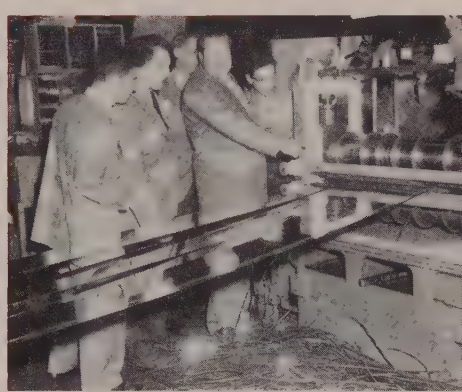
WITH 165 other steel warehouses pushing as hard in the same area of sales as his own firm, John G. Berry, 40-year-old president of Kenilworth Steel Co., was convinced Kenilworth should take strong competitive steps forward this year.

Mr. Berry wanted to inform present and potential customers of new products and services which Kenilworth offered and get them to take a look at the company's doubly-expanded facilities. He felt, however, that this news could be hooked to other information of further service to these customers.

On Display — Thus was born the "Kenilworth Clinic"—a week-long open house, advertised as "not a carnival . . . or an exposition . . . or a side show . . but a sincere attempt to stimulate (metalworking management's) thinking in the direction of aggressive planning and change." Shearing, slitting, leveling and edge rolling equipment was on view and operated for visitors at the Kenilworth, N. J., warehouse. Thirty manufacturers of equipment for metalworking plants displayed the latest in their respective lines.

Preplanned—Effort was made to show the visitors something new and helpful every step of the way. Kenilworth even had a private dining car sitting on the company siding to serve lunches and suppers.

Did it work? One man present wanted to buy 20,000 pounds of steel but wanted to see it slit on the spot. He was accommodated, of course. Another visitor, writing a thank-you note, told Mr. Berry that Kenilworth would be considered as a basic source of supply for many products he hadn't known Kenilworth sold. To prove it, an order for 1000 pounds of aluminum was enclosed.



Slitter, above, helped trigger order for ten tons of steel to be slit on the spot

Thirty manufacturers of metalworking equipment accepted Kenilworth's invitation to display their products at the clinic

The Seaway . . .

New Channel for Business

Concluding article in a series of three

By WILLIAM M. ROONEY
Market Editor

NFA

More vehicles will move by water to ocean ports . . .

VAST INDUSTRIAL and trade expansion is predicted for the entire Great Lakes region following completion of the St. Lawrence seaway.

Some proponents think the deep-water channel from the lakes to the Atlantic will prove the greatest boon to Mid-America since construction of the Erie canal about 129 years ago. They see midwestern cities doubling in population with business and industry, stimulated by a rising tide of trade through newly created inland sea ports, burgeoning in all directions.

In the Future—Such views may be unduly optimistic and extravagant. Certainly, extreme predictions at this stage are premature, considering completion of the project is six or seven years away at earliest.

About 10 million tons of freight now move annually through the 14-foot channel of the St. Lawrence. When the seaway is deepened to 27 feet, the tonnage flow will rise to 50 million yearly, says Maj. Gen. S. D. Sturgis Jr., chief of the Army engineers corps. Of this total, 30 million tons will be incoming freight, of which 20 million will be iron ore from Labrador and possibly other foreign sources. Of the predicted outgoing movement of 20 million tons, the bulk will be grain and coal.

Big Trade Already—Although foreign commerce is expected to account for only 25 per cent of traffic through the seaway, its importance to midwestern manufacturers and business, and its benefits generally, will be great and widespread. Already 164 different categories of freight are moved through the Great Lakes to and from foreign ports. These range from furs, fish and farm products to heavy machinery, steel, china, clay and pigments. Most of the cargo is and always will be commodities requiring seasonal movement. The river and lakes, because of ice, are impassable for about four months of the year, December to March.

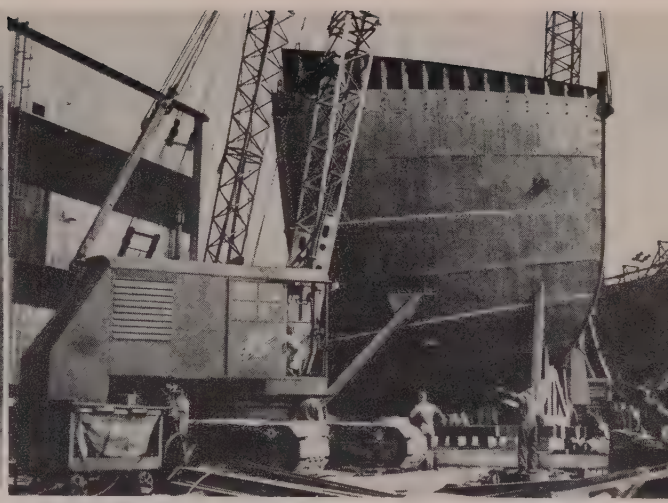
Role of Ore—Iron ore has had much to do with development of a navigable Great Lakes-St. Lawrence waterway—both with the earliest development, the Soo locks in 1855, and this latest project. The year 1855 really marks start of Lake Superior ore shipments to the steel mills in Ohio and Pennsylvania.

From 1855 through 1952 a total 2,832,293,879 gross tons of iron ore, virtually all of it running in excess of 51 per cent iron natural, have been moved down the lakes from the 12 Lake Superior ore ranges, about 90 per cent through the Soo. Of the total, the Mesabi range, opened in 1892, contributed by far the largest tonnage, 1,851,384,243.

Problem of Attrition — The heavy drain on the Lake Superior ores has begun to take its toll. The easily accessible, richer ores of the Mesabi are beginning to taper off. Consequently, the steel-

Iron Ore of Canada

abrador ore will add millions to east-west tonnage . . .



U. S. Steel

Lake shipbuilding and repair facilities will boom . . .

akers have been directing increased efforts toward utilizing ue billions of tons of low-grade aconite and other ores at ead of the lakes, and developing ew sources, such as Labrador, enezuela and Liberia.

Actually, Lake Superior ores ill continue to supply the major hare of the nation's requirements ar into the future. This year bout 75 million tons will come own the lakes. Ore from other ources largely will supplement hat from the Superior district. t is estimated that the annual demand for ore may be increased by 5 million tons in the next 20 ears. Labrador and other foreign res will be utilized to meet this rowth in demand.

A Door Opens—Construction of he seaway assures easy and economical access to the lakes for arriers with Labrador ore which ill first move 360 miles by rail o Seven Islands, Que., then be oaded into large vessels for shipnent to Ashtabula, Cleveland and ther Lake Erie ports.

Without the enlarged seaway, it s claimed, growth of heavy industry in the future would take place n areas in the East and South vith access to sea-borne raw materials.

Get Ready—It will take years or the full seaway potential to e realized. In the meantime, programs for construction of acilities and the stimulation of rade with other nations are beng mapped. Shipbuilding and ship repair yards may require substantial expansion at lake ports.

Trade relations with foreign nations will have to be fostered. The seaway of itself will not automatically bring an economic bonanza. Trade must be cultivated intensively, although Great Lakes business interests are not strangers in this area of the economy.

Experienced—In 1952 auto exports were valued at around $1-billion with one of every 20 cars or trucks produced going to foreign markets. Automotive workers in Michigan, Indiana and Ohio are estimated to have participated in export business to the extent of $650 million.

Exports of electrical machinery in 1952 from Ohio, Indiana and Michigan amounted to more than $100 million. Approximately a third of the workers in civilian aircraft plants in the three states owe their jobs to exports.

Role of Imports—Imports play just as important a role. For example, the steel mills must import manganese. In 1952 they used the equivalent of 150 shiploads of this vital ore. Also they imported many other critical ores.

European shippers are watching seaway developments closely. They view the project as constructive. But they are reluctant to commit themselves on future plans until the program is further along than at present. They feel the seaway must be accompanied by far-reaching improvements in facilities at lake ports if it is to be fully effective.

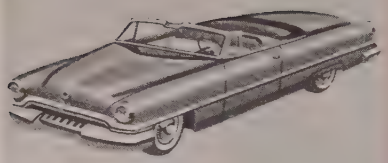
Also, tariffs and general trade relations raise questions for the future, which, obviously, only time and legislative acumen will clear away.

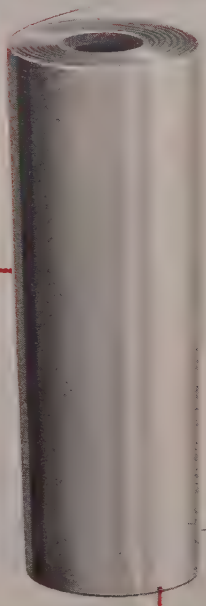
Basic Aids—There is basic agreement that the seaway ultimately will:

1. Assure maintenance of heavy industry in the Midwest;
2. Vastly increase foreign trade, possibly doubling or trebling exports and imports of the region;
3. Develop markets in foreign countries as economical transport places the region in better competitive position with more favorably situated areas with respect to ocean shipping;
4. Result in tremendous savings in shipping costs to domestic areas;
5. Attract industry from other districts.

The Great Lakes region, with only 0.75 per cent of the world's land area and 2 per cent of the world's population produces more than 35 per cent of world steel output. A correspondingly large proportion of the world's manufactured goods of all kinds comes from the general area. More freight moves over the Great Lakes route now than the tonnage moved through the Panama, Suez and Kiel canals combined.

Still greater economic prestige seems in store for the region when the St. Lawrence seaway is completed.





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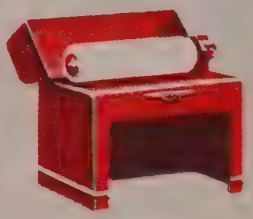

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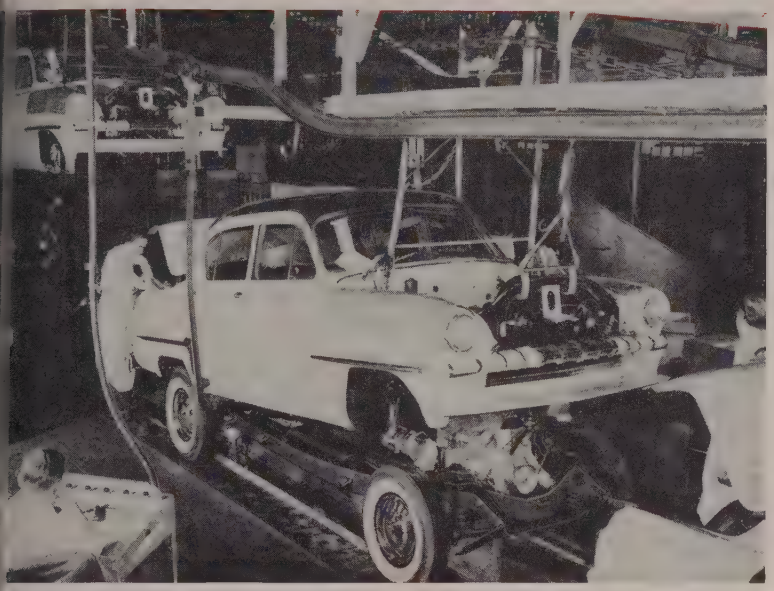

iiant Plymouth Assembly Plant Reveals Unique Techniques

DETROIT

you should ever be asked on a iz show which auto plant can ake more cars in one day than y other plant in the world, pre- re now to take home a year's pply of dog food.

For it's none other than the ymouth plant in Detroit, a build- g with a 28-acre edifice complex pable of turning out three of e rock-named vehicles every min- e.

Assembled Figures—The statis- s they give the tourists are im- essive—4161 electric motors, 27 iles of conveyors and 12,000 em- oyees assembling 8 million pounds Plymouths daily. With all this ppening on one floor level and ıder one continuous roof about a lf-mile long, the plant is billed the world's most modern auto- obile factory.

All this starts with a lineup of aiting trucks loaded with Ply- outh bodies from the Mack ave- ue body plant some six miles away. There are 22 trucks with 176 bodies continuously en route to the plant. And when you figure that the plant gobbles a truckload of eight bodies every two and a half minutes, the enormity of this transportation chore alone merits a gulp. Twenty minutes with no bodies and 12,000 employees go out for a beer.

Smoothly Planned — However that occurrence is a rarity and the flow of trucks into the unloading shed is strikingly smooth. Inside, the bodies are quickly hoisted off the trailers and dropped onto dollies. Scheduled into production before they arrive at the Plymouth plant, they are started down the hardware line in proper order. Here such items as rear view mirrors and special equipment are installed, fenders and radiators are added and the grill assembly is attached.

By this time the body is over at the chassis line on the far side of the plant, where a few things have already happened up to this point. Down at the far end of the building the chassis was set in motion with the same message that started the body on its way. Options include such items as power steering for which brackets are required on the chassis, and a tag is attached detailing such information. Front and rear suspensions are added together with muffler, power brakes, etc., and the chassis passes through a spray booth where it is automatically sprayed.

Timing — Emerging from this thorough painting and a subsequent drying oven right on the line, the chassis next gets its wheels. Plymouth wheels, by the way, are sprayed automatically in batches and loaded into racks for scheduling after baking. Designated for a particular car when they leave the racks, the wheels start their trip to the assembly line in the nude, picking up on a merry-go-round the tire and tube shipped to the plant with the tube already inside the tire under slight air pressure.

Having received brake lines and wheels, the chassis is dropped to the floor. This is mighty lucky, for at this point from the side arrives an engine which could not otherwise be dropped into the chassis at all. The method of dropping is unique, employing a dip in the engine conveyor line which simply brings the engine down to meet the chassis. Two employees locate the rear mounting lugs with pins while a third synchronizes the engine with the chassis by means of a rheostat bringing both together simultaneously.

Dipping "Drop" — Wheels are checked on the move for caster and camber in a unique traveling alignment device, and steering column and rear bumper are added. The chassis is now ready for the body drop, which in fact is not a "drop" at all. For whereas in most plants bodies are lowered by crane from the second floor, Plymouth bodies are traveling along serenely on a conveyor which dips over the chassis line. As in the engine drop, the bodies are lowered

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by moving forward down the dip and the rheostat control of the body line accomplishes the major alignment with two pins guiding the body into place. The relative precision of this operation is highlighted by the fact that only about ½-inch clearance exists between the fan and the radiator core being lowered in front of it.

From there on, the car gets a few minor items like steering wheel and hood and moves off the assembly line a completed auto. The time elapsed since the chassis started its journey a half-mile back is just 55 minutes. While the two parallel assembly lines are the most obvious production point in the plant, plenty happens in the 28 acres that has not yet been mentioned. For example there's the matter of the conveyors.

Overhead Stocks — You won't find a lot of assembly stock on the plant floor because most of it's up overhead. Tires ride endlessly on a conveyor, being replenished from freight cars as they are taken off. The same is true of hoods, fenders, and many of the other major stock items which circle by the spot where they are needed, and when a man wants one he takes it off. A three-day supply of stampings, transmissions, etc. is continually moving overhead in the Plymouth plant, though such items as nuts, bolts, hardware, etc. are stored in bins in the assembly area.

This is a highly interesting concept in plant design, utilizing enclosed cubic space fully and having things at the right place at the right time constantly. But although this may sound like an operation better adapted to volume than option tailoring, the Plymouth plant probably turns out more varieties of car than any comparable operation. Not only does it handle over 50 colors with keyed interiors which add to stocks and scheduling to the tune of several hundred thousand dollars annually per color, but it also builds export Dodges and DeSotos.

Export Story—Thereby hangs a tale in itself, for the export Dodge Kingsway and the DeSoto Diplomat are nothing more or less than Plymouths with special grills and medallions. Often including right hand drives with speedometers in kilometers, special engines to meet displacement laws of foreign countries and lists of options that could choke a language student, these export cars go right down the assembly lines with the regular Plymouths in a remarkable tribute to flexibility usually incompatible with volume output.

This is a tribute as well to the notable Plymouth nerve center which schedules the cars through telescribers. A visitor to the center noted an export DeSoto spec slip lying on a table. Inquiry revealed that the car was being held up for a clock. As you may know, the clock in the export DeSoto (or Plymouth) mounts on the top of the dash. It was explained, however, that mounting the clock on the line would take practically no time at all, whereas adding it after the car was built would take two or three hours. Hence, hold up the car until the clock is available.

In Control—A nerve center that knows not only that the clock isn't available but that it would save money to wait to schedule the car until it is provided gives much of the essential feeling you get when you visit the Plymouth operation: Tremendous volume and tremendous flexibility but with hair-li control.

There are many other items note at the Plymouth plant. N even mentioned is the Plymou engine assembly which utiliz among other special devices crankshaft balancer of unusual d sign. The shaft is placed on o side of the machine, and six kno are individually adjusted to bri the needle back to zero. The sha is next placed into a fixture on t other side of the machine whe the six knobs have actually a justed the depth of feed for s drilling heads. While these hea move in to remove the amount metal required for balance, anothe shaft is being balanced to repe the process.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,231	782,491
May	642,559†	685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,821

Week Ended	1954	1953
May 1	159,206	184,800
May 8	154,640	179,621
May 15	153,796	177,805
May 22	157,993	162,447
May 29	149,596	125,868
June 5	145,000*	134,619

Source: Ward's Automotive Reports.
*Estimated by STEEL.
†Preliminary.

Packard To Build Bodies

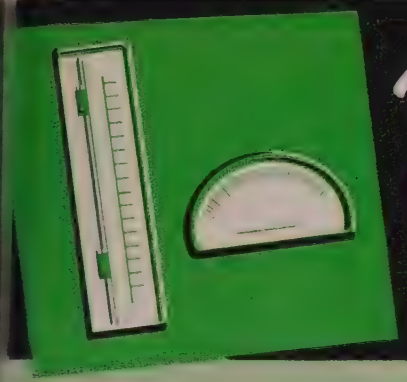
A five-year lease agreement wit an option to buy on the Chrysle Briggs-Connor plant will put Pack ard back into the body business fo the first time since 1941. Present ly engaged in the production o Packard bodies under a supplie relationship between Chrysler an Packard, the single story facilit has one section that is two storie in height, making it adaptable fo paint and trim, and encompasse 760,000 square feet of manufactur ing space.

Hudson to Wisconsin

Hudsons will be built in Kenosha and Milwaukee plants of American Motor Corp. in 1955. Concentration of production was dictated by completeness of the facilities there, explained George W. Mason, president, in announcing the move.

Emphasizing that American Motors will continue Nash and Hudson as distinct lines of cars with separate sales, service and national dealer organizations, Mr. Mason expects to "market a more competitive line of cars."

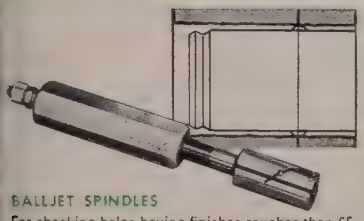
A special task group is working on the development of new business to maintain employment in Detroit at the highest possible level through building auto components, parts fabrication or government work. If nothing new is developed, employment at the Hudson plant will be halved at the model changeover.



Modernize FOR LOW COST PRODUCTION with Newest Developments In Air Gaging

Already these newly developed practical precision tools are helping produce more and better products at lower cost in innumerable plants throughout the world.

Space restrictions here preclude anything more than the briefest description. Phone, wire or write for specifications, prices and delivery—or call the Sheffield sales engineer in your vicinity.



BALLJET SPINDLES

For checking holes having finishes rougher than 65 micro-inches, for porous parts, narrow lands or checking to the very end of a hole. Setting is made with gage blocks and a Standard Calibrator. NO MASTER SETTING RINGS REQUIRED— not even one.

ADJUSTABLE SPINDLE KIT

One, two, three or four spindles may be quickly assembled from components in the kit, for any size between 1 and 3 inches. Gage blocks are used to set for size and to calibrate air gage for amplification.

ADJUSTABLE AIR BORE GAGE

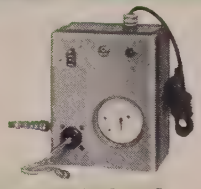
A light, high precision (2,000 to 1 amplification) self-centering bore gage that is easily adjustable from 3" to 12" in diameter. Calibrated by a Standard Calibrator and gage blocks.

AIRETEST INDICATOR

Replaces an indicator where more accuracy and higher amplification are required. Always gives precise readings regardless of the direction of approach. No lag—no gears—nothing to wear out of adjustment. Amplifications up to 5,000 to 1.

AIRELECTRIC HEAD

Converts air pressure variations at the gaging contact into electrical impulses which actuate classification and segregation mechanisms or machine control devices. Accurate to a fraction of a "tenth".

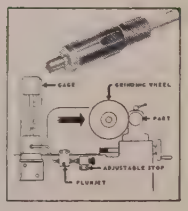


ELECTRO-PNEUMATIC UNIT

A self-contained unit of Airelectric Head, indicating dial and signal lights. Easily mounted on the machine to control machine operation by precision measurement of the machined surface. Makes machining automatic. Also used for automatic gaging and segregating.

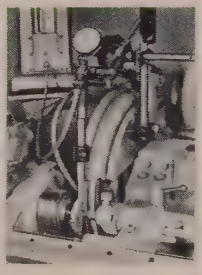
PLUNJET FEED GAGE

The key element of the machine "Feed Gage" which eliminates error due to feed screw wear. Also, due to the high amplification, makes it easy to manually control the feed to fractional "tenths"



PLUNJET CALIPER TYPE GAGE

Air Gaging Cartridges are used with Caliper Gages for continuous sizing of work on external grinders. Dial is used for approach —PLUNJET brings to final size.



PLUNJET GAGING CARTRIDGES

Precise, low-cost gaging elements which you may incorporate in your own gaging fixtures singly or in multiple to measure practically any dimension or geometrical relationship, with tolerances ranging from .0005 to .100.

GAGE DIVISION, *The Sheffield Corporation*
Dayton 1, Ohio, U.S.A.

6756

MASTER CRAFTSMAN SHEFFIELD HEADQUARTERS

SHEFFIELD

PHONE, WIRE OR WRITE

HERE COMES 30,000 lbs. OF SCRAP . . . handled in a one-man load, handled over-the-road by the ROSS Carrier!

Most people don't think of industrial scrap handling as a unit-load proposition. It's usually a pretty messy operation—scrap merely dumped on any empty spot in the yard. But Central Iron & Metal Company, Battle Creek, Michigan, has put scrap handling on a fast, efficient basis simply by capitalizing on the unique advantages of the Clark-Ross Carrier.

Central Iron & Metal provides their suppliers with fabricated collection boxes or "gondolas". These vary in length from 10 to 20 feet; some have a gate at one end to allow a man to roll in a wheelbarrow and dump the load of scrap. The Clark-Ross Carrier delivers an empty gondola and picks up a "full" at each of the plants served. The Carrier speeds back to the scrap yard. drops the "full", then takes off on another call. Neither rain nor snow can stay these swift Carriers from the completion of their appointed rounds!

Central operates two 30,000 lb. Carriers. They're fast on the road (up to 40 mph) and fast on the load—takes only 3 seconds to pick up or drop a load. Central's customers like the system because of the "good housekeeping" factor. Central likes it because it's fast and inexpensive—a one-man operation which may cover several hundred miles a day.

CLARK EQUIPMENT

ROSS CARRIER LINE
Industrial Truck Division
CLARK EQUIPMENT COMPANY
Benton Harbor 26, Michigan

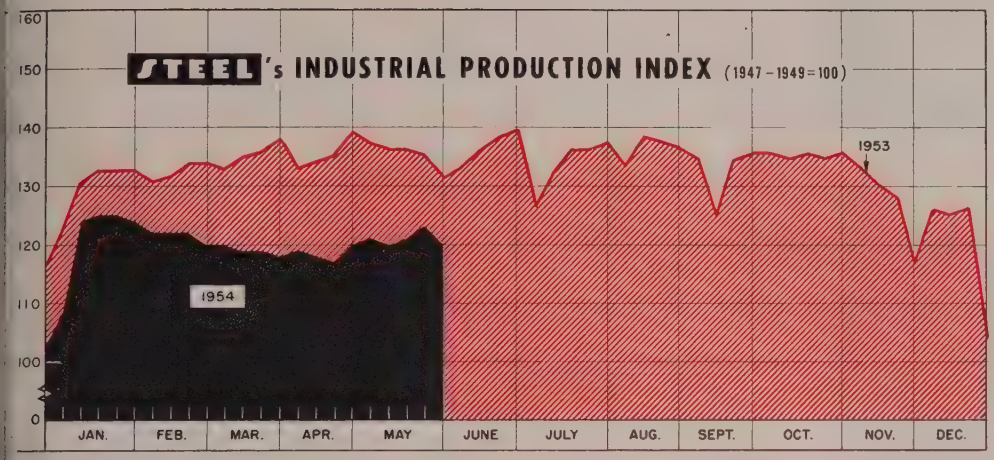
☐ Send details on the carriers

Name_____

Company_____

Address_____

City_____ Zone_____ State_____



LATEST WEEK*	120
PREVIOUS WEEK	123
MONTH AGO	120
YEAR AGO	131

Week ended May 29

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%

.ook for June To Continue Mild Business Upturn

HANCES ARE GOOD that busi-ess for the rest of June will be etter than in May if the current ·ends of business continue. Past iat point, it is any man's guess, ut optimism prevails in many uarters.

Any upturn that comes now will e slight, but even that can be en-ouraging. Most signs point that ay. For instance, a survey of 12 ey states shows that new claims or unemployment compensation uring the week ended May 22 ropped to the lowest level so far is year, except for the holiday eek of Feb. 21. The latest figure f 190,694 for those states is still ell above the 129,420 registered the similar week of 1953. The otal number claiming compensa-on is also on the downgrade and ill probably continue that way. owever, students entering the arket will give unemployment s customary summer upturn.

Scattered Reports — At present iere are more reports of hiring nd rehiring than of layoffs. Ply-outh Division of Chrysler Corp. nnounced a production increase t its Evansville, Ind., plant of 20 er cent on June 1. That was ie third increase in 30 days for iat plant. Kaiser Aluminum & hemical Corp. has recalled the ast 600 persons laid off last win-ter at the Trentwood aluminum rolling mill near Spokane. Additional rehiring will lift the summertime employment peak at the plant to nearly 3000. Normal level is 2500. William M. Allen, president of Boeing Airplane Co., believes the Defense department procurement policy will keep employment in the aircraft industry from dropping off too much. That contention was fortified recently when the Air Force signed contracts with two aircraft companies calling for delivery of about $109 million worth of jet fighters and trainers. On the other hand, International Harvester Co. is planning

BAROMETERS OF BUSINESS

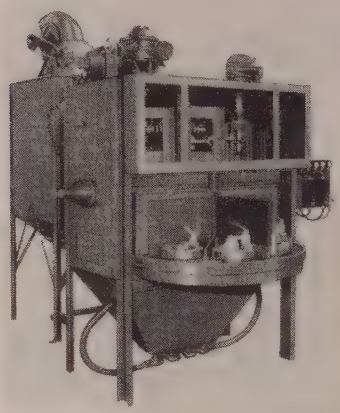
	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,680	1,712	2,262
Electric Power Distributed (million kwhr)	8,280[1]	8,373	7,961
Bitum. Coal Output (daily av.—1000 tons)	1,190	1,183	1,461
Petroleum Production (daily av.—1000 bbls)	6,425[1]	6,435	6,360
Construction Volume (ENR—millions)	$288.5	$330.4	$257.6
Automobile, Truck Output (Ward's—units)	149,596	157,993	125,868
TRADE			
Freight Car Loadings (unit—1000 cars)	670[1]	682	787
Business Failures (Dun & Bradstreet, no.)	220[1]	248	168
Currency in Circulation (millions)[3]	$29,697	$29,707	$29,825
Dept. Store Sales (changes from year ago)[3]	−5%	−8%	+8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,794	$20,724	$16,605
Federal Gross Debt (billions)	$273.2	$273.2	$266.2
Bond Volume, NYSE (millions)	$17.6	$20.8	$15.8
Stocks Sales, NYSE (thousands of shares)	10,728	11,151	5,843
Loans and Investments (billions)[4]	$80.5	$79.7	$76.0
U. S. Gov't Obligations Held (billions)[4]	$33.0	$32.0	$28.8
PRICES			
STEEL's Finished Steel Price Index[5]	189.75	189.74	182.82
STEEL's Nonferrous Metal Price Index[6]	213.2	212.6	224.0
All Commodities[7]	111.0	111.3	109.8
Commodities Other Than Farm & Foods[7]	114.3	114.4	113.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

MACLEOD
ABRASIVE BLAST EQUIPMENT

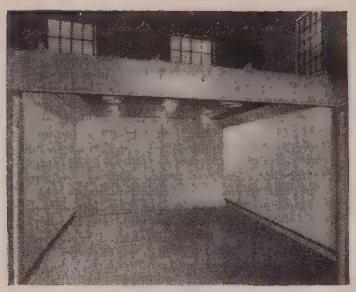
M

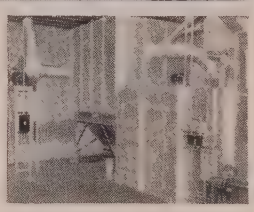
NEW! the HIGH-SPEED
MACLEOD "RAPID-BLAST"
BLAST CLEANING CABINET



The brand new Type AL "Rapid Blast" is specifically designed for high rate of continuous production. Features automatic, positive-locking, indexing rotary table, and can be furnished with interchangeable work chucks for runs of different items. Particularly adaptable for internal cleaning of work.

MACLEOD
BLAST CLEANING
ROOMS



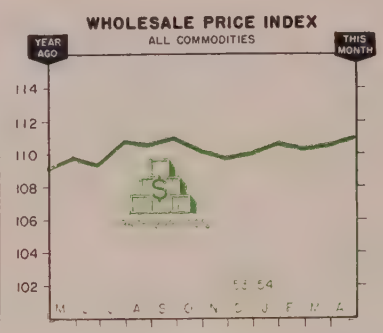


Available in standard or special sizes as required. Can be equipped for chain-fall hoist or for blast cars. Air baffles replaceable. Dust Arrestors (at right) also available for adjacent or outside building installation.

57 YEARS of SERVICE TO INDUSTRY

The MACLEOD COMPANY, Dept. S-6
BOX 452, Sharonville, Ohio
Send this coupon for MACLEOD Bulletins:
☐ No. 300-A Cabinets ☐ No. 600 Rooms
NAME _____
ADDRESS _____
CITY _____ ZONE ___ STATE _____

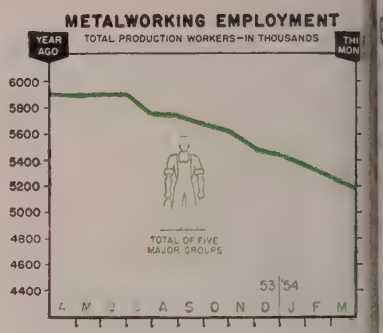
THE BUSINESS TREND



(1947-1949=100)

	1954	1953	1952
Jan.	110.9	109.9	113.0
Feb.	110.5	109.6	112.6
Mar.	110.6	110.0	112.3
Apr.	111.1	109.4	111.8
May	....	109.8	111.6
June	....	109.5	111.3
July	....	110.9	111.8
Aug.	....	110.6	112.2
Sept.	....	111.0	111.7
Oct.	....	110.2	111.1
Nov.	....	109.8	110.7
Dec.	....	110.1	109.6

U. S. Bureau of Labor Statistics.



Production Workers—Five Major Groups
In Thousands

	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
1953					
Mar.	1,145	952	1,335	925	1,574
Apr.	1,144	952	1,321	926	1,576
May	1,138	952	1,307	919	1,556
June	1,143	956	1,300	911	1,548
July	1,134	938	1,264	892	1,533
Aug.	1,131	950	1,236	903	1,523
Sept.	1,117	944	1,228	913	1,493
Oct.	1,099	929	1,219	905	1,479
Nov.	1,076	907	1,205	885	1,423
Dec.	1,061	879	1,202	856	1,460
1954					
Jan.	1,035	877	1,193	829	1,441
Feb.	1,014	866	1,188	816	1,400
Mar.	991	847	1,174	802	1,375

U. S. Bureau of Labor Statistics.

Charts Copyright 1954 STEEL.

to lay off about 1300 employees over the next several months at its Rock Island, Ill., and Memphis, Tenn., plants.

As employment goes up, so does production. One large producer of truck trailers is increasing substantially its June schedules with a like increase for July; double that increase is scheduled for August. Taking even a longer look ahead, L. S. Hamaker, sales manager of Republic Steel Corp., told the National Association of Purchasing Agents that within the past 60 days his company has revised its thinking about the dip in steel business. Republic originally thought that the recession would extend about 30 months from July, 1953. Now the period has been shortened to 15 months as the company foresees a modest upturn beginning this fall.

Early Holiday Drops Index . . .

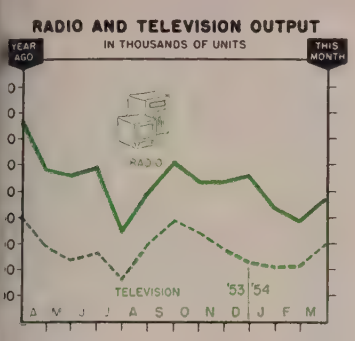
STEEL's industrial production index dipped to a preliminary 120 for the week ended May 29 (1947-1949 = 100) from the previous adjusted reading of 123, reflecting in part the auto industry's early start on the Memorial Day week end. U. S. producers rolled 119,585 autos off the assembly lines during the week ended May 29, says *Ward's Automotive Reports,* as the Big Three closed down on Saturday to give their workers the advantage of a three-day holiday. *Ward's* predicts the average daily assembly rate in June will be 23,200 compared with 24,700 in May. If that holds true, first-half production will total about 2,962,000 cars compared with the record 3,255,772 in first half last year.

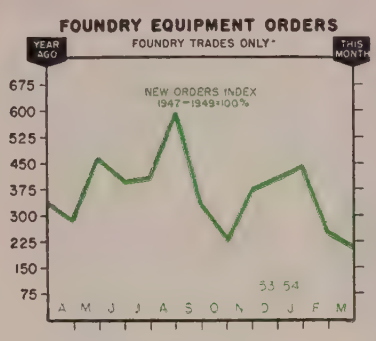
Boost for Shipbuilding? . . .

The shipbuilding industry is watching Washington closely since the Senate passed and sent to the House a bill authorizing private construction of 20 big tankers for charter to the Navy. Under the plan, the Navy would agree to hire the ships from the owners who finance them for charter periods of not more than 10 years.

Feeling the Heat . . .

As hot weather arrives, activity picks up in the air conditioning industry. Trane Co. expects a sharp rise in sales and profits for 1954 with first-half sales topping last year's record of $45.5 mil-





	Thousands of Units			
	Radio		Television	
	1954	1953	1954	1953
Jan.	872	1,093	421	719
Feb.	769	1,192	427	731
Mar.	940	1,549	600	810
Apr.	...	1,159	...	568
May	...	1,109	...	482
June	...	1,164	...	524
July	...	674	...	316
Aug.	...	992	...	604
Sept.	...	1,217	...	770
Oct.	...	1,052	...	680
Nov.	...	1,066	...	560
Dec.	...	1,101	...	450
Total	...	13,368	...	7,214

Radio-Electronics-Television Mfrs. Assn.

	Index (1947-1949=100)		Value Thousands	
	1954	1953	1954	1953
Jan.	173.8	99.6	$2,463	$1,418
Feb.	99.9	97.5	1,423	1,388
Mar.	82.7	132.2	1,089	1,882
Apr.	....	111.8	....	1,592
May	....	182.1	....	2,594
June	....	156.4	....	2,227
July	....	158.9	....	2,263
Aug.	....	235.5	....	3,353
Sept.	....	127.7	....	1,818
Oct.	....	87.1	....	1,241
Nov.	....	149.4	....	2,128
Dec.	....	160.8	....	2,290

Foundry Equipment Mfrs. Assn

on by 10 to 15 per cent. The company expects booming school construction to provide a big market for its unit ventilator. It foresees greater future profits from units for conditioning the entire house than from individual room coolers. Carrier Corp. is banking on both types of units with the announcement that it will improve and rearrange its Syracuse, N. Y., facilities to make possible a 75-per-cent increase in production.

New Orders Continue Climb . . .

Another definite indication that summer business will be up is the fact that manufacturers' orders in April continued the increase that has been going on since February, reaching $23.1 billion on a seasonally adjusted basis. That is 1 per cent over the $22.8 billion recorded for March and represents an increase of $1.1 billion over February. All of the April increase came in nondurable goods, which rose from $12.7 billion to $12.9 billion. Declines in transportation equipment and fabricated metals offset the rise in new orders of machinery and primary metals in the durable goods field.

At the same time, book value of inventories declined $500 million during April on a seasonally adjusted basis with most of the action in durables. Value of inventories of all manufacturers stood at $45.5 billion at the end of the month, about $100 million above the year-ago level. Sales also improved during the month, with the increases about equal in both durable and nondurable goods. But with deliveries exceeding new orders, the backlog declined 3 per cent from March to April.

Trends Fore and Aft . . .

Cash dividends of $1274 million paid in March by corporations issuing public reports were 3 per cent above dividends in the same 1953 month. . . First installment of a long-range expansion for Brown & Sharpe Mfg. Co., machine tool maker, is a modernization and retooling of its automatic screw machine division which will cost $2-million, the largest single appropriation in the company's history. . . Heavy construction contracts for the week ended May 27 were higher than in the same 1953 period for the fourth consecutive week, *Engineering News-Record* says. Mass housing awards continue strong.

Which kind of Cold Rolled Strip Steel is best for You ?

CONSIDER SHEET COIL

—if variations in physical characteristics are permissible.
—if fairly heavy oversize gauge variations are not objectionable.
—if the fabricating operations are not too complicated and do not require intricate expensive dies.
—if a fine surface finish is not essential.
—if a good base for paint or enamel is desired.
—if you do not object to some "square footage" loss due to oversize variation.
—then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

—if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
—if you wish to keep die wear low, no oversize gauge variations.
—if you require a fine finish or a better base for plating.
—if you want maximum yield for "most finished parts per ton."
—if you want selected tempers for maximum strength and lightest weight.
—then you'll find Thinsteel the most economical material by far.

You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

THE Kenilworth Steel co.
750 BOULEVARD,
KENILWORTH, NEW JERSEY

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

Telephones: N. Y. COrtlandt 7-2427
N. J., UNionville 2-6900
Teletype: Roselle, N. J., 387

Built for Better Production

Hardtem Die Blocks

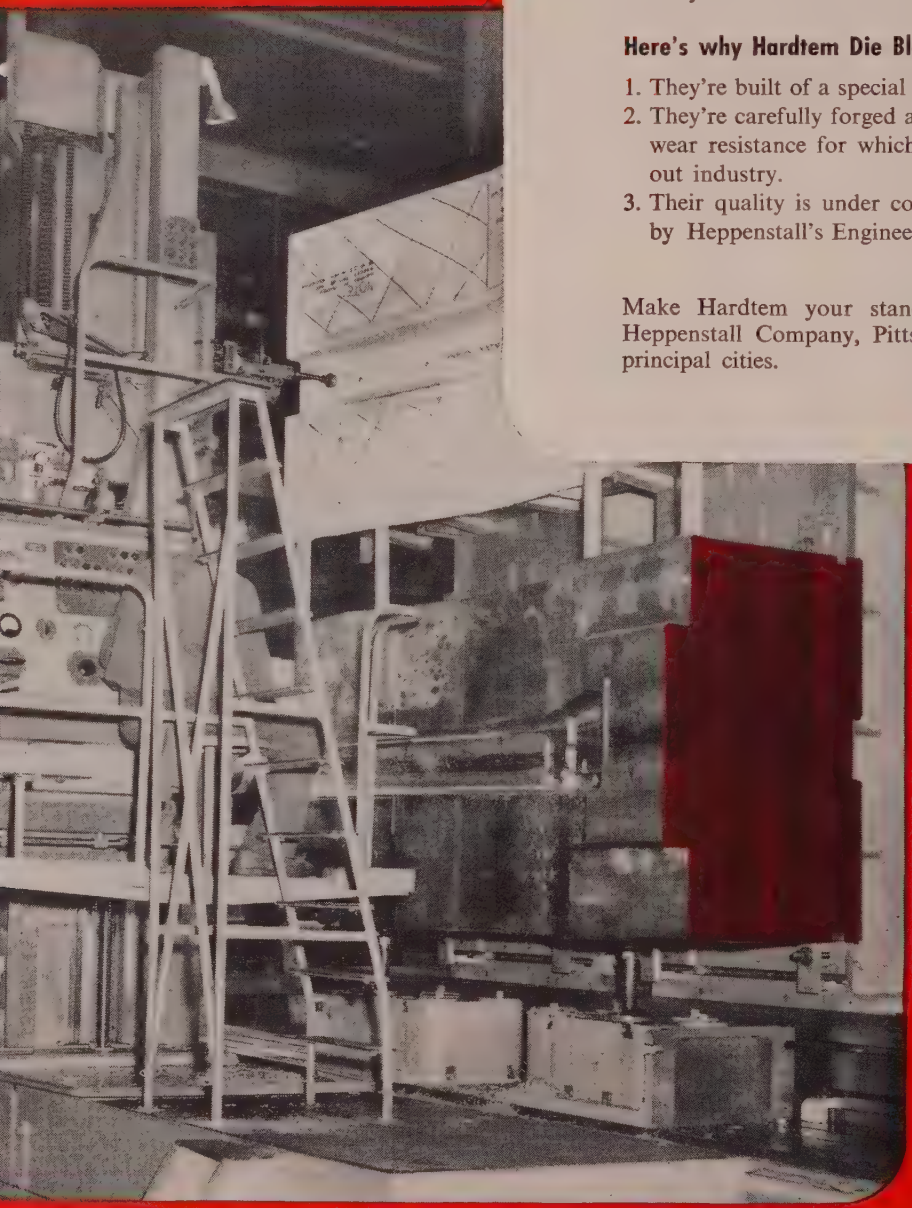
Here's what Hardtem Die Blocks mean to Better Production!

1. They're tough . . . they resist impact stress.
2. They withstand heat.
3. They are uniform in hardness.

Here's why Hardtem Die Blocks assure better results!

1. They're built of a special patented Heppenstall Steel.
2. They're carefully forged and heat treated to provide the wear resistance for which they are recognized throughout industry.
3. Their quality is under constant study and development by Heppenstall's Engineering and Research staff.

Make Hardtem your standard die block specification. Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.



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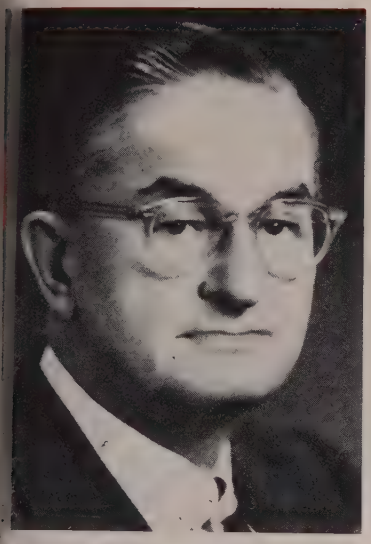
Heppenstall

. . . the most dependable name in die blocks



WHITLEY C. COLLINS
. . . heads Northrop Aircraft Inc.

hitley C. Collins was elected pres-ent of **Northrop Aircraft Inc.**, awthorne, Calif. He succeeds **aj. Gen. Oliver P. Echols** who ed May 15 in Los Angeles.

dward A. Farwig was made chief ıgineer and **Otto Haisch** assistant the sales manager of **Buhr Ma-ıine Tool Co.**, Ann Arbor, Mich.

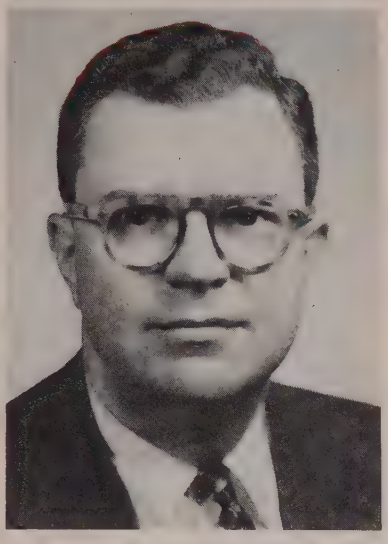
. D. Christian, president since 941 of **Safway Steel Products nc.**, Milwaukee, was elected hairman of the board. **David G. mith,** vice president-production, s now president.

dmund L. Bataille was made ales manager for **Winslow Co. nc.**, Newark, N. J., manufacturer f electrical instruments and test quipment.

loy J. Keller was appointed execu-ive vice president in charge of op-rations at **TelAutograph Corp.**, Jew York. He has been vice resident-sales since 1948. He al-o holds the position of secretary nd acts as security officer.

Villiam Blackie was elected an ex-cutive vice president of **Caterpil-ar Tractor Co.**, Peoria, Ill. He has een a vice president since 1944.

New Jersey Zinc Sales Co., Chi-cago office, appointed **Ralph F. Burns** manager of metal sales, western district.

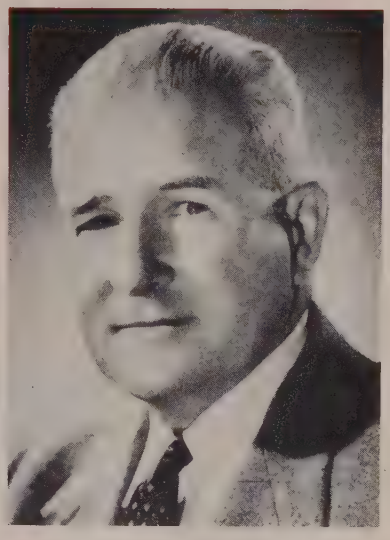


WILLIAM C. WOODWARD
. . . Alcoa forging sales mgr.

William C. Woodward was made manager of forging sales for **Aluminum Co. of America.** With headquarters at the Cleveland Works, he will co-ordinate sales of aluminum and magnesium forgings in Alcoa sales offices throughout the country. He succeeds the late **M. W. Hodgdon.**

M. J. Boho, vice president-sales at **Hagan Corp.**, Pittsburgh, was elected vice president and general manager of the corporation and of its subsidiaries, Hall Laboratories Inc., Calgon Inc. and Buromin Co.

M. J. BOHO
. . . gen. mgr. for Hagan and subsidiaries



B. L. OWENS
. . . Atkins Saw Div. sales mgr.

B. L. Owens was advanced to sales manager, **Atkins Saw Division,** Borg-Warner Corp., Indianapolis. He was director of marketing. **M. A. Bauer,** former manager-contract department, is assistant sales manager. **M. A. Straub,** recently with Rheem Mfg. Co., is assistant sales manager in charge of advertising and sales promotion.

Winfield Shiras III was named purchasing agent for the meter division of **Westinghouse Electric Corp.**, Pittsburgh. **R. M. Wilson** was made sales manager of defense products and is succeeded as Mississippi Valley district manager at St. Louis by **F. N. Wightman.**

George F. Henschel was named general manager of sales for **American Can Co.**, New York. **Abbott W. Sherwood Jr.** and **Richard D. Cleaves** were made assistant New York district sales managers of the metal division.

Jack Mikolajczak joined the sales staff of **Baron Steel Co.** in Detroit to head up and operate a newly formed brokerage division. He was formerly with Kaiser-Frazer Corp. The firm's Detroit office was moved to new quarters at 16939 James Couzens Highway.

Robert J. Garnik is head engineer for product design and development of the Nopak Division of **Galland-Henning Mfg. Co.**, Mil-

H. G. BAUER

W. A. NEUMANN

. . . De Laval Steam Turbine-De Laval Separator exec. posts

waukee. He succeeds **R. W. Peterman**, named division sales manager.

De Laval Steam Turbine Co., Trenton, N. J., appointed **H. G. Bauer** to the new post of vice president and general sales manager. His previous duties were those of vice president in charge of engineering and manager of the marine division. **W. A. Neumann** resigned as vice president in charge of sales at De Laval Steam Turbine to assume new duties as executive vice president and treasurer of **De Laval Separator Co.**, Poughkeepsie, N. Y.

George B. Coale was appointed general manager of **National Lead Co.'s** Baroid Sales Division, New York. He succeeds **George L. Ratcliffe** who remains active with the division in his capacity of vice president of National Lead.

Walter W. Hambrecht was made finishing division manager at **Standard Pressed Steel Co.**, Jenkintown, Pa.

R. A. Kimes, former manager of **American Machine & Foundry Co.'s** general engineering laboratories, is now director of engineering of the AMF electronics division at Boston.

G. A. Hardesty was named manager, production programming and control department, tractor and implement division, **Ford Motor Co.**, at Birmingham, Mich. At Ford's aircraft engine division in Chicago **Victor Z. Brink** succeeds **Ben D. Mills** as assistant general manager. Mr. Mills was made assistant general manager, special products division, Detroit.

Thomas C. Collins was named district manager of a new office opened in Buffalo by **Superior Steel Corp.** at 1212 Rand Bldg.

Pfaudler Co., Rochester, N. Y., elected **William H. Klee** a vice president of Pfaudler Inter-American Corp. in charge of sales in a newly created territory which includes Florida, Mexico, Central America, the Caribbean Islands and t northern coast of South Americ He is replaced as Pfaudler gener sales manager by **H. Ivor Edward**

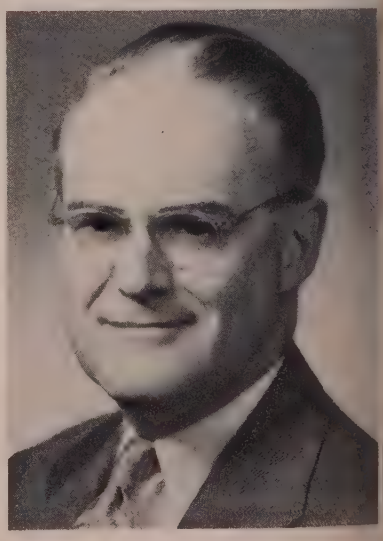
Four officers were promoted new positions in **National Ste Corp.**, Pittsburgh, and its subs diary companies, **Great Lakes Ste Corp.**, Detroit, and **Weirton Ste Co.**, Weirton, W. Va. **Paul Ca nahan**, senior vice president Great Lakes Steel, was electe president of that company. **Jame A. Henry**, vice president of Na tional Steel and also vice president sales of Weirton Steel, was electe vice president and director sales of National Steel. **Wilmer A Murphy**, executive vice president Weirton Steel, was elected vic president and director of purchase and raw materials of National Steel. **Lee D. Brueckel**, vice presi dent-export sales, was elected vic president-sales at Weirton.

Walsh Refractories Corp., St. Lou is, elected **A. J. Tomasek** president **J. J. Duggan** vice president and manager, glass refractory sales and **W. K. Schweickhardt** vice president, manager, refractory sales

Lindberg Engineering Co., Chicago appointed **E. B. Jones** chief engineer in charge of estimating and engineering in its newly formed field-erected equipment division.

George R. Foster was appointed manager of the stainless steel divi-

WILLIAM H. KLEE

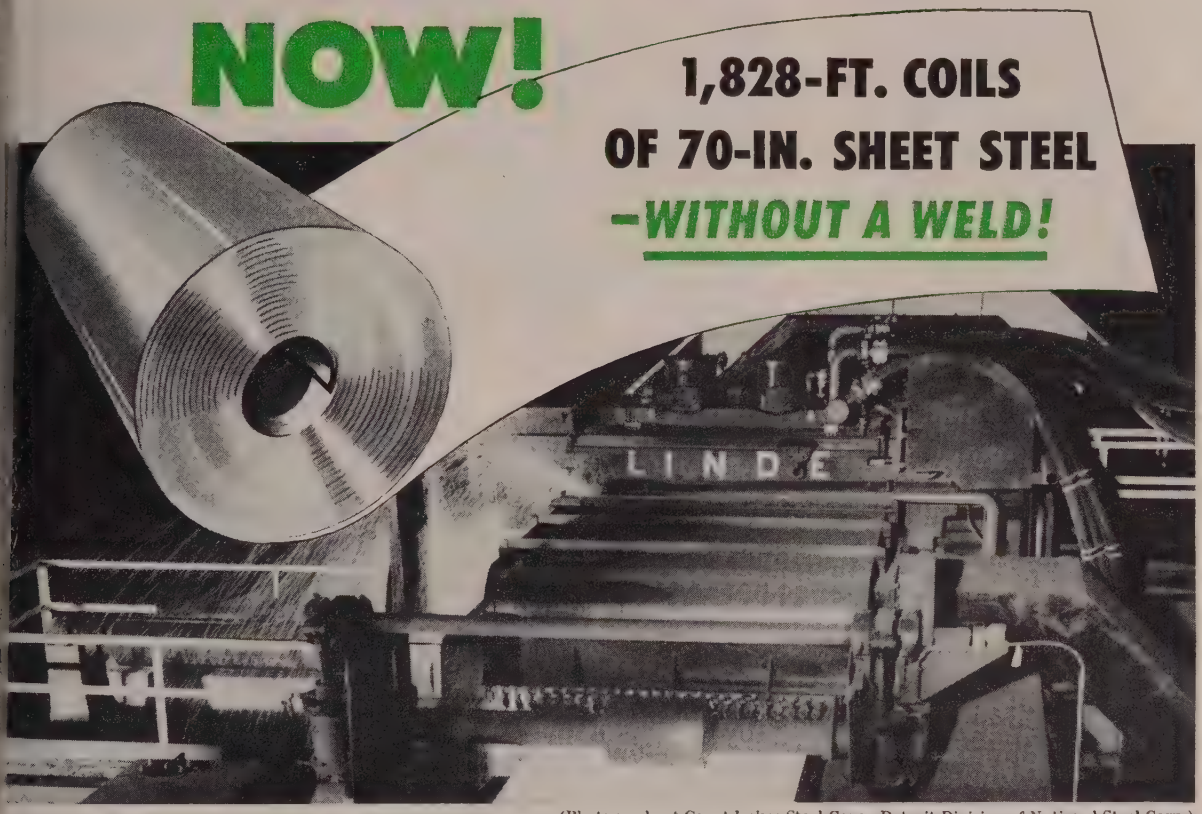


H. IVOR EDWARDS

. . . Pfaudler Co. executive appointments

Oxygen—and LINDE SERVICE—in action:

NOW! 1,828-FT. COILS OF 70-IN. SHEET STEEL —WITHOUT A WELD!



(Photo made at Great Lakes Steel Corp., Detroit Division of National Steel Corp.)

EIGHT-TON COILS of 60- to 77-inch-wide sheet steel are usually composed of four lengths of steel welded together. Users, such as the automotive industry, lose time and material cutting out these welded joints. Now, a major steel producer has met this problem with a remarkable new slabbing mill. Instead of 2½ or 3-ton slabs, this mill turns out 8-ton slabs, each of which is rolled into a single, weld-free coil up to 1,828 feet long, in .0359 inch thickness.

Size wasn't the only key to the success of this mill. Its output had to be flawless. That's where oxygen and LINDE SERVICE came into the picture. Working with plant engineers, LINDE designed and built a LIN-DE-SURFACER scarfing machine as a part of the mill.

As the slab passes through the LIN-DE-SURFACER, oxygen jets burn surface scale and defects off the top and bottom simultaneously, at speeds up to 160 feet per minute. The conditioned slab is then ready for rolling into flawless one-piece coils of high quality sheet steel.

This is another example of how LINDE Oxygen and LINDE SERVICE serve the steel industry. LINDE SERVICE is the unique combination of research, engineering, and more than 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

If your company uses oxygen, LINDE SERVICE can mean dollar savings to you. Let us tell you how.

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N.Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company
Division of UNION CARBIDE CANADA LIMITED

Linde Trade-Mark

HERMANN A. BOTTENHORN

HUGO LORANT

PAUL MAYER

. . . executive positions announced at Loewy-Hydropress

sion, general sales department, **United States Steel Supply Division,** U. S. Steel Corp., Chicago.

William D. Reed was appointed works manager, midwest division, **H. & B. American Machine Co. Inc.,** Indianapolis. He was formerly superintendent of fabrication at the Convair Division of General Dynamics Corp., San Diego, Calif.

Frank A. Benoit Jr. was appointed foundry and pattern shop superintendent, **Brown & Sharpe Mfg. Co.,** Providence, R. I., to succeed **LeRoy M. Sherwin,** retired.

Arthur T. Hunter and **Fred O. Pahmeyer** were elected vice presidents of **Combustion Engineering Inc.,** New York.

Hydropress Inc., New York, elected **Hermann A. Bottenhorn** vice president in charge of its Loewy rolling mill division. He joined Loewy-Hydropress in 1946 and has been serving as chief engineer. **Hugo Lorant,** vice president and a director of Hydropress, was elected senior vice president and **Paul Mayer** becomes assistant vice president.

Curtiss-Wright Corp. appointed **Ralph T. D. Montagu** sales manager of its metals processing division in Buffalo.

Vernon Swan, ingot products supervisor at **Reynolds Metals Co.'s** sales headquarters, Louisville, was made manager of the firm's Plant 5 located on Camp Ground road, Louisville, which produces general purpose aluminum alloy ingot for use in foundries.

Maj. Gen. John K. Christmas, recently retired from the army, joined **Barium Steel Corp.** as a special assistant in its Washington office.

Robert M. Burford was named sales supervisor of the newly created Buffalo district for the metal processing department of **Pennsylvania Salt Mfg. Co.**

R. Herman Hammer was elected president and general manager of **Globe-Wernicke Co.,** Cincinnati.

Charles B. LeBon was elected vice president, **Arcadia Metal Products,** Arcadia, Calif.

OBITUARIES . . .

Meyer Botwinik, 51, vice president and secretary, **Botwinik Bros.,** New Haven, Conn., died May 20.

Charles E. Kindelberger, 54, executive assistant to the president, **North American Aviation Inc.,** died May 17 in Los Angeles.

Francis M. Parsons, 56, vice president and sales manager, **Kellogg Switchboard & Supply Co.,** Chicago, division of International Telephone & Telegraph Co., died May 24.

R. W. Sternke, 56, vice president and production manager, **Lakeside Bridge & Steel Co.,** Milwaukee, died May 6.

John H. Sainsbury, 69, chairman of the board and former president, **Ross Operating Valve Co.,** Detroit, died in Florida May 18.

Maj. Gen. Oliver P. Echols, 62, USAF, ret., chairman of the board and chief executive of **Northrop Aircraft Inc.,** Hawthorne, Calif., died May 15.

Ernest A. Herrcke, 65, manager of the Chicago office of **National Automatic Tool Co.,** died Apr. 10.

Hubert L. Cornelison, 69, who retired two years ago from **Austin Co.,** Cleveland, after 35 years in engineering and sales contract work, died May 22.

Harold W. Jewell, 63, purchasing agent, **Aero Supply Mfg. Co. Inc.,** Corry, Pa., died May 18.

Bradley T. Frazier, 56, sales representative for **National Forge & Ordnance Co.,** Warren, Pa., died May 19.

Lee A. Swem, 54, vice president, **Foster Wheeler Corp.,** New York, died May 24.

Edward A. Derby, 77, New York district manager, **National Screw & Mfg. Co.,** died May 19.

A.W.

CONTINUOUS MILL

PLATE • SHEET • STRIP—*available in hot rolled quality*

The quality of Alan Wood Steel is of prime importance to both our customers and ourselves. Our Continuous Mill produces steel from .059″ to .500″ to a maximum width 25½ inches, furnished in coils or cut lengths as required. Rigid metallurgical control means that you get *what you want!* Years of steel making experience plus our mine-to-mill undivided responsibility assures you the best quality steel possible to produce.

Because we're located in the heart of the East's great industrial and transportation area, we can often make faster delivery.

More than a century and a quarter of iron and steel making experience.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

BERYLCO BERYLLIUM COPPER

now available coast to coast from warehouse distributors

Beryllium copper—well established as a standard design material in industry—is now available in many areas from local sources.

With the help of leading non-ferrous distributors throughout the country, The Beryllium Corporation has established local stocks of Berylco beryllium copper for your convenience. By ordering directly from your nearest distributor you can . . .

Reduce inventory costs
Speed up delivery
Eliminate your warehouse risks
Reduce your capital investment
Save purchasing time

You can buy Berylco Beryllium Copper from these Warehouse Distributors

GUARDIAN METAL SALES, INC.
1911-15 N. Clybourn Ave., Chicago 14, Ill.

NEW YORK BRASS & COPPER CO., INC.
376 Lafayette St., New York 3, N.Y.

GENERAL COPPER & BRASS CO.
410 MacDade Blvd., Collingdale, Penna.

BRASS & COPPER SUPPLY CO. INC.
501 West 23rd St., Baltimore 11, Md.

PECKOVER'S LTD.
115 McCormack St., Toronto 9, Ont., Canada

WILLIAMS AND COMPANY, INC.
901-37 Penna. Ave., Pittsburgh 33, Pa.
3700 Perkins Ave., Cleveland 14, Ohio
851 Williams Ave., Columbus 8, Ohio
3231 Fredonia Ave., Cincinnati 29, Ohio
1109 S. Preston St., Louisville 3, Ky.

MEIER BRASS & COPPER CO.
2971 Bellevue Ave., Detroit 7, Mich.

EASTERN METAL MILL PRODUCTS CO.
21 Vale Street, Boston 19, Mass.
12 Hilton St., Providence, R.I.

THE E. JORDAN BROOKES CO., INC.
7 Front St., San Francisco 11, Calif.
5138 W. Jefferson Blvd., Los Angeles 16, Calif.

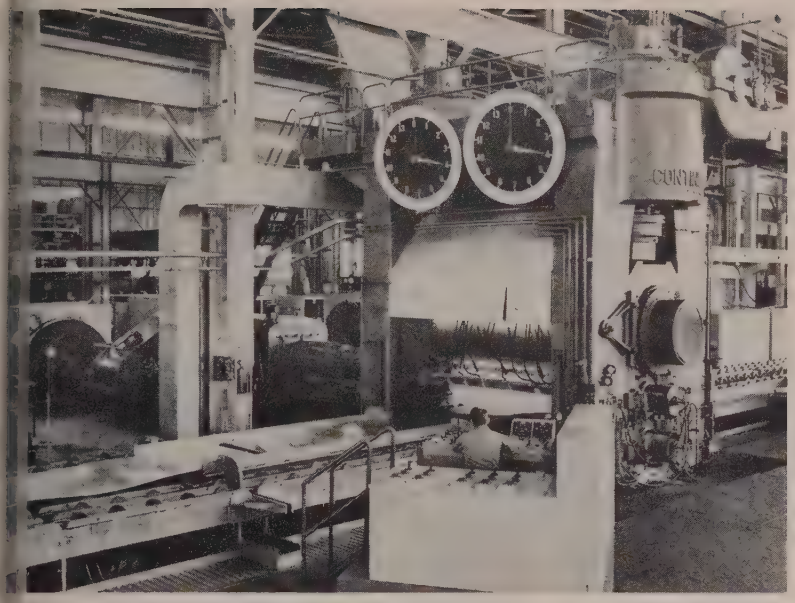
J. M. TULL METAL & SUPPLY COMPANY, INC.
285 Marietta Street, N.W., Atlanta, Georgia

For mill requirements, custom or precision rolled strip, or engineering assistance, The Beryllium Corporation offers Technical Advisory Service through its district sales offices, or general offices at Reading, Pa.

BERYLCO

THE BERYLLIUM CORPORATION, READING 19, PENNSYLVANIA

Tomorrow's products are planned today—with Berylco beryllium copper



Alcoa's new rolling mill in Davenport . . .

idens Range of Tapered Aluminum Sheet and Plate

B of supplying improved mate-ls for big, high-speed aircraft k a step forward when Alumi-m Co. of America, Pittsburgh, gan operating last week its ta-ed sheet and plate rolling mill its Davenport, Iowa, Works.

The 144-in. mill is rolling tapered minum sheet and plate up to 10 wide for the wing skins of the tion's latest military aircraft. ll-tapered sheet was limited pre-ously to much narrower widths.

Joint Venture—The new mill rep-sents a joint effort by Alcoa and e Air Force to provide desired ng surface material for such air-aft as the Boeing B-52 and B-47 bombers. The use of this prod-t, which tapers in thickness as extends from the fuselage to the ng tip, provides necessary wing rength without increasing weight.

This rolling mill and some auxil-ry equipment were supplied to lcoa under a lease arrangement ith the Air Force. Two buildings closing the 52,000 sq ft of space ecessary to house the operation ere built by Alcoa. In addition, e Davenport Works has avail-le the additional production uipment needed for use with this w Air Force mill.

Breakdown operations for rolling e tapered product are being han-led by a 144-in. breakdown mill d a 100-in. hot continuous mill which were existing equipment at the Davenport Works. In addition to heat-treating equipment in normal use at the plant, the Air Force contract added two new reheating furnaces and an aging furnace. Additional roller-leveling equipment was installed to supplement existing equipment for flattening the tapered sheet and plate.

Range Broadened—Operation of the 144-in. mill has made a profound change in the range of tapered sheet and plate available to aircraft designers. The width in which these products are available has been increased to 10 ft. Lengths are available up to a maximum of 40 ft. The maximum thickness at the heavy end has been increased to 1.50 in.

Tapered sheet, when used for the wing and tail skins and spar webs of aircraft, adds desired strength and stiffness to the wing structure with a minimum of weight. By using sheet or plate that tapers in thickness as it extends from the fuselage to the wing, increased strength is provided in the high stress areas of the wing.

Other types of sheet and plate products required by the aircraft industry include longitudinally tapered material having multiple tapers and also material having transverse tapers. To meet these requirements, a large milling machine capable of machining plates 10 x 40 ft, and a 7 x 40 ft taper grinder are being installed. The equipment is also under the lease arrangement with the Air Force.

Caterpillar Opens York Plant

Caterpillar Tractor Co., Peoria, Ill., opened its plant in York, Pa. The dual-purpose facility manufactures certain replacement parts for the firm's line of track-type tractors and also serves as a regional storage and shipping center for the company's entire parts line.

Sandmeyer Expands Warehouse

Sandmeyer Steel Co., Philadelphia, enlarged its quarters to include an additional 15,000 sq ft of storage and work area. The firm warehouses stainless steel and specializes in custom-cut stainless steel plate products.

GE Expanding Rome Plant

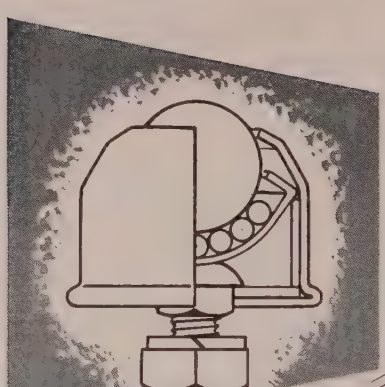
General Electric Co., Schenectady, N. Y., is expanding its recently dedicated $25-million power transformer plant at Rome, Ga. Estimated cost of the project, including new equipment, is $2 million. Additions to manufacturing facilities will be for the manufacture of paper wound insulating tubes and new annealing facilities.

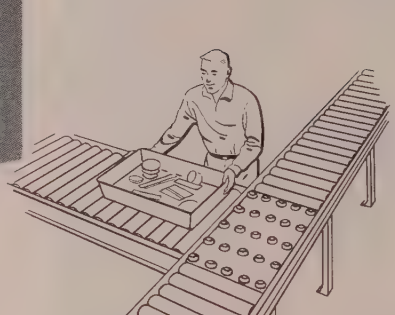
Ft. Worth Firm Changes Hands

Controlling interest in Fort Worth Steel & Machinery Co., Ft. Worth, Tex., manufacturers of power transmission and oil mill equipment, was acquired by Moroney, Beissner & Co., a Houston investment banking firm. President of Fort Worth Steel, J. I. Jackson, was retained in office. J. D. Brance is executive vice president of the firm.

Beaumont Becomes Alco Plant

Beaumont Iron Works Co., Beaumont, Tex., has been merged formally into its parent corporation, American Locomotive Co., New York. The parent company has taken over the trademarks and other legal rights which had belonged to Beaumont, a wholly





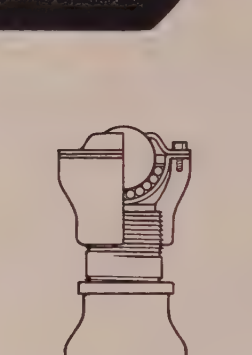
Logan Ball Transfer units consist of a large steel ball which rotates on a bed of small balls contained in a hardened steel cup.

BALL TRANSFERS

Logan Ball Transfers are handling equipment, designed primarily for use in transferring at right angles or where it is desired to rotate packages without lifting. Can be adapted to other applications. You can buy separate ball assemblies from stock or complete tables made-to-order.

Logan offers Ball Transfer units in several different sizes.

Further information on request.



Ball Pedestal units also available for handling sheets and plates.

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

Prefab Bridge

Sections for spillway bridge at Chie Joseph Dam on Columbia river ar preassembled by Bethlehem Pacifi Coast Steel Corp., then lifted int place by 25-ton capacity cableway Section is 30 x 49 ft, weighs 24 ton

owned subsidiary. While continu ing production of oil drilling an producing equipment, Beaumon has facilities for the assembly, re pair and maintenance of heat ex changers and is producing valves Further diversification of the firm' activities is expected.

Metal-Cladding Buys Plant

Metal-Cladding Inc., Buffalo, pur chased a plant in North Tonawan da, N. Y., and will move its opera tions to the new site as soon a renovations and alterations can b completed.

Jessop Continues To Expand

Jessop Steel Co., Washington Pa., intends to continue company improvements at the same level a last year. The firm's main projec now is realignment of bar mill fa cilities.

Crucible Steel Opens Branch

Crucible Steel Co. of America Pittsburgh, opened its branch sale office and warehouse at 4200 W Douglas Ave., Milwaukee. Herber C. Ende Jr., manager of the branch says a full line of specialty steel and Crucible's tool steel will b stocked. The branch also handles the full line of products of Tren

keloid pre-plated finish-
available on these base
tals: steel, zinc, brass,
oper, and aluminum.

MODERN STYLING STARTS WITH A MODERN METAL

The eye appeal of brilliant metal in modern product design is undeniable. Whether used functionally or for decorative trim or both, pride of ownership is established. The buyer wants more than utility... he wants the warm glow of possession of an article that is smart-looking, stylish, attractive. Nickeloid Metals, with their durable, plated finishes of chromium, nickel, brass or copper should be considered in your program of product design. These metals are beautiful and easy to keep that way. They are easy to fabricate. They are available in sheets or coils, bright or satin, and in a range of interesting crimps and stripes. They can be etched, silk-screened, or lithographed. They can be adhered to wood or paper board. American Nickeloid Company wishes to assist in your design activities by making working samples available to you.

Write for new Booklet covering properties, uses and fabrication techniques for Nickeloid Metals.

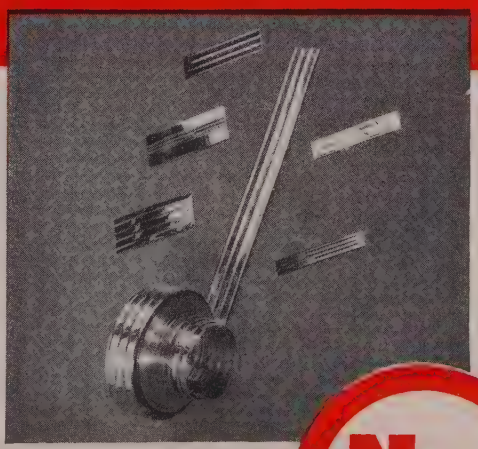
NICKELOID METALS

Product Designer's Paradise!

More than a Metal • It's a Method

PRE-PLATED FOR ECONOMY

The cost-minded executive will at once appreciate the production advantages of Nickeloid Metals. Being pre-plated, they are immediately ready for assembly when stamped or formed. They require no further costly steps of plating or polishing, with the attendant handling and cost of rejects. Nickeloid Metals come to you as a beautifully *finished raw material.* And the quality of finish meets the highest of standards, for we have been supplying pre-plated metals for over half a century. Utilize this kind of plating experience by asking to have a sales engineer call on you.



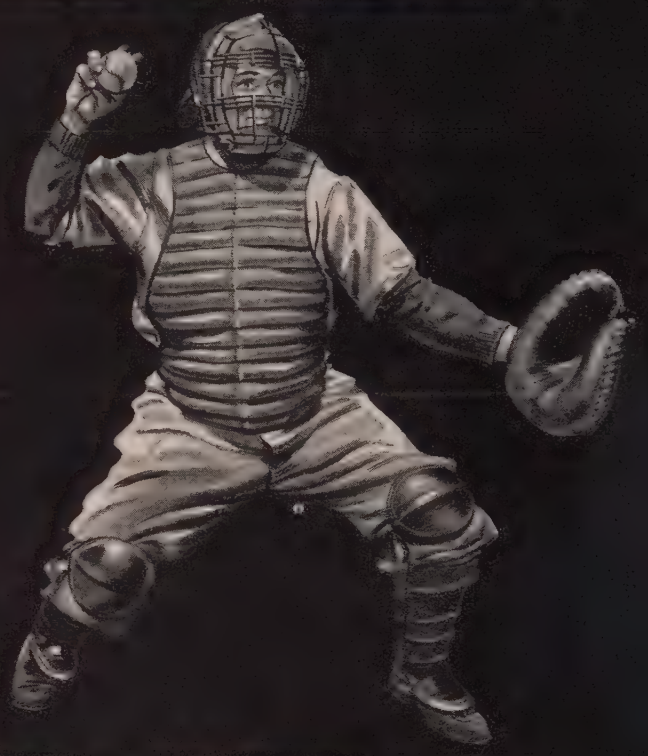
Quality Metals Since 1898

AMERICAN NICKELOID COMPANY

ADMINISTRATIVE OFFICE: Peru 1, Ill.

MILLS: Peru, Ill. and Walnutport, Pa.

Just as a catcher needs protection . . .

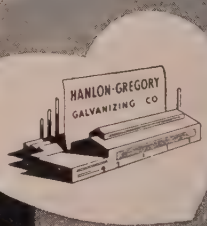


IRON and STEEL
***Need* PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

IN THE HEART OF THE STEEL INDUSTRY



Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant

galvanizing . . . pickling . . . painting . . . oiling

ube Co., East Troy, Wis., pro-cer of welded stainless steel tube d pipe.

nduit Plant Opened in East

Pittsburgh Standard Conduit ., Pittsburgh, opened its Morris-lle, Pa., plant which will obtain pe for its manufacturing opera-ons from the continuous weld ill of National Tube Division, nited States Steel Corp., which is cated on adjacent property.

REPRESENTATIVES

Transmission Equipment Co., ew York, appointed as sales rep-sentatives in their respective ter-tories: Harry Holland & Son Inc., hicago and Detroit; Siewert quipment Co., Rochester, N. Y.; astern Brace - Mueller - Huntley nc., Albany, N. Y.; Rutan & Co., hiladelphia; Charles G. Lamb, To-onto, Ont.; Warren M. Pike Asso-ated Inc., Boston. All of these rms will handle steel weldments abricated by Acme Welding Divi-on, United Tool & Die Co., West artford, Conn., for whom Trans-ission Equipment is national rep-sentative.

Trane Co., LaCrosse, Wis., mak-r of air-conditioning, heating, ven-lating and heat-transfer equip-ent, appointed Robert S. Knowles s a sales representative in its ichmond, Va., office.

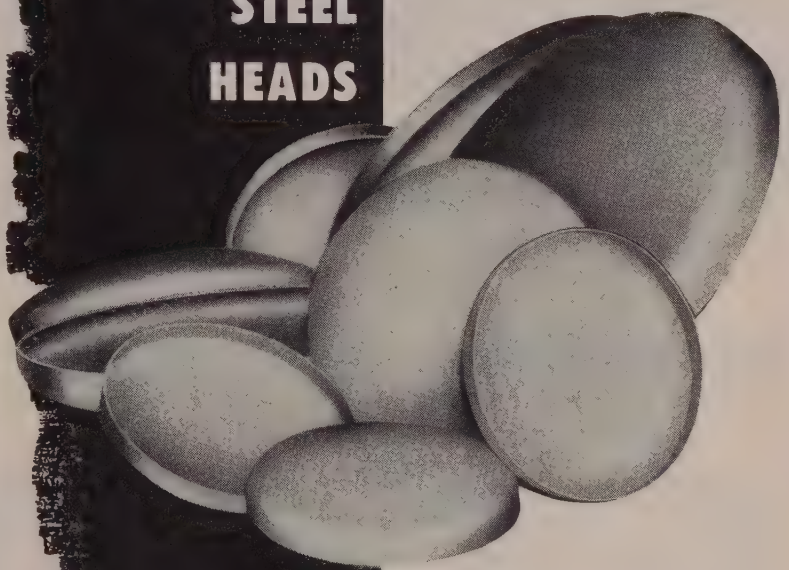
Alloy Precision Castings Co., leveland, appointed Gibney-Decot orp., Buffalo, as exclusive sales gent in western and northern New ork state.

Parker Appliance Co., Cleveland, ppointed Standard Products Inc., ulsa, Okla., as distributor for its)-rings.

Thomas C. Ford and **Robert C.** ord established a warehouse in irmingham for distribution of roducts made by five tool and quipment manufacturers: Firth terling Inc., Pittsburgh; Morse wist Drill & Machine Co., New edford, Mass.; Bay State Abrasive roducts Co., Westboro, Mass.;

(*Please turn to page* 98)

"Heads-up" Service in STAINLESS STEEL HEADS



Fabricators rely on G. O. Carlson, Inc. for stainless steel heads produced to exact specifications and for other components of stainless steel tanks. Shells, flanges, rings, pads as well as spun or press-formed heads are readily available as a packaged service. This eliminates the need of multiple ordering from several suppliers and places responsibility in the skilled hands of Carlson specialists.

Carlson stainless steel heads are produced in a wide range of sizes and gauges to ASME and standard specifications. Many styles of forming dies are available. There's an up-to-date folder describing these dies—write for your copy now!

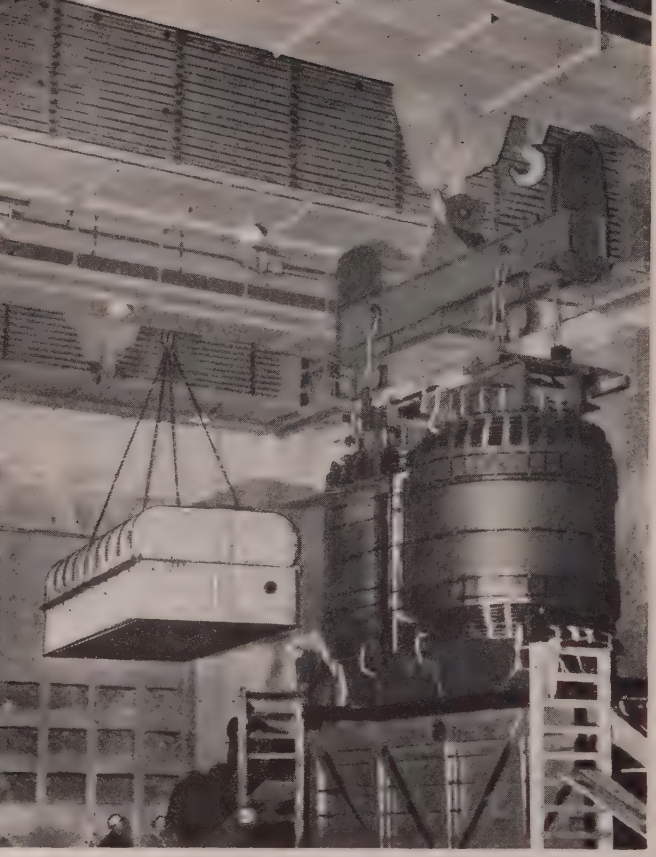
Stainless Steels Exclusively

G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities



PINPOINT SPOTTING is easy with a General Electric equipped crane, just as this one delicately positions the core and coils of a large power transformer. At the other extreme . . . .

HIGH-SPEED PERFORMANCE is "job-tailored" into this whirly crane control. Each G-E control, built of standard components, is co-ordinated to the crane's characteristics.

New General Electric Control Is

SPECIAL TESTS were performed from this 85-foot outdoor test tower to develop G-E crane control -one of the many testing facilities at G.E.'s modern Schenectady, N. Y. plant.

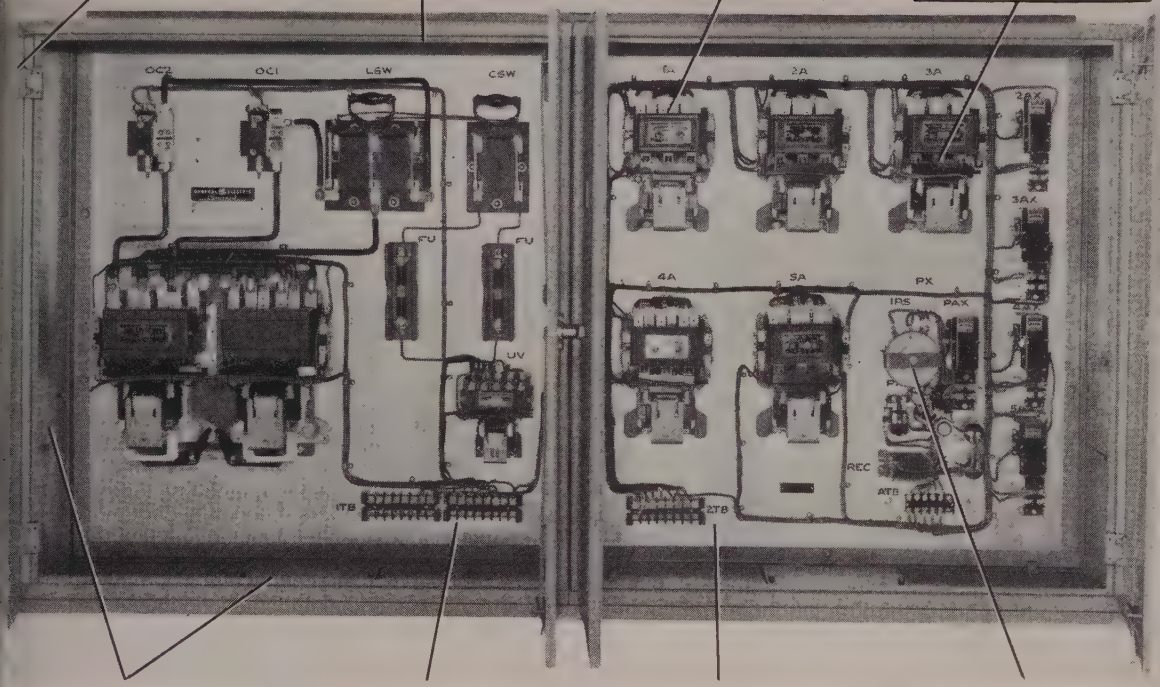
FIELD ENGINEERING specialists in crane control are always available from G.E. to help apply the technical know-how developed in G-E laboratories to your installation needs.

APPROXIMATELY 17"

HIGH

FRONT-CONNECTED

CONTACTS REMOVABLE FROM FRONT



LARGE CONDUIT OPENINGS

ACCESSIBLE TERMINAL BOARDS

CLEARLY LABELED COMPONENTS

ADJUSTMENTS MADE FROM FRONT

EW EASY-MAINTENANCE FEATURES, as well as the proven ependability of the famous G-E "strong-box coil" motor arter, are now built into all G-E controls—here illustrated on a bridge and trolley control. With the addition of the new G-E NEMA II control (NEMA Service Classification for light-duty control), G.E. offers a truly complete line.

"Job-tailored" to Your Crane

-E a-c crane control is tailored to your new crane's ration *at the factory.* G-E engineers, working ely with your crane builder, design and build a trol that's perfectly co-ordinated to the crane racteristics. When it's delivered to you, it's ready perate.

NTROL RESPONDS INSTANTLY to the operator's ctions, guiding the brawn of your crane with a cticed hand. That's because G.E. supplies the plete, integrated crane drive, each component igned to match the others right down the line.

GGED CONSTRUCTION provides long, dependable vice—only routine maintenance required. Adjustnts, when desirable, are easily made. All compots are standard, and each can be quickly replaced ecessary.

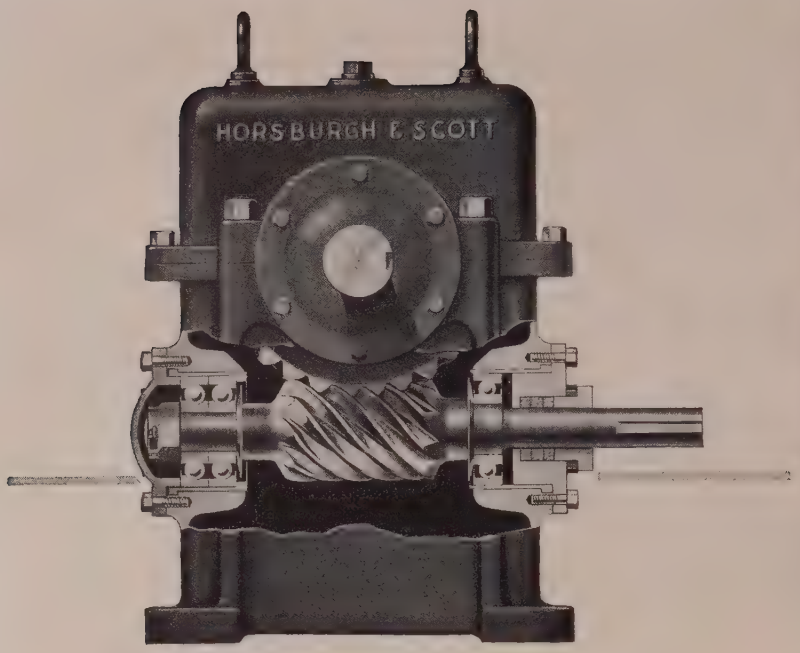
T G.E. STARTED EARLY in working with your crane manufacturer to "job-tailor" a control for your crane. For more information, contact your nearby G-E Apparatus Sales Office, your crane builder, or write Section 780-1 for Bulletin GEA-6112 on G-E a-c crane control and accessories. *General Electric Company, Schenectady 5, N. Y.*

Section E780-1
General Electric Company
Schenectady 5, N. Y.

Please send me your new bulletin GEA-6112 which gives complete information on the G-E line of a-c crane control.

Name . . . . . .
Position . . . . . .
Company . . . . . .
Address . . . . . .
. . . . . .

GENERAL ELECTRIC



efficient, long life . . .

WORM GEAR SPEED REDUCERS

by Horsburgh & Scott

Every modern element for reducing friction and other losses is incorporated in these reducers...hardened and accurately ground worm made from special case hardening steel, accurately made gear from chilled bronze to H & S specifications, anti-friction bearings, accurate alignment, smooth streamline interiors and proper lubrication. Due to its glass hardness, worm wear is nil...due to its accuracy, gear wear is negligible. Throughout their long life these reducers maintain their initial high efficiency.

10 ADVANTAGES

Extreme Simplicity	Extra Strength
Compactness	Low Maintenance
Efficiency	Oil-tight Housing
Long Life	Quiet Operation
Smooth Transmission	Wide Range of Ratios

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

Pipeline Competitor

This is second of four tankers being built at Newport News (Va.) Shipbuilding & Dry Dock Co. for Cities Service Co. First, the 38,000-ton 707-ft *W. Alton Jones*, was launched in April, capacity 14,112,000 ga.

(*Continued from page* 95)

Nicholson File Co., Providence, R. I.; and Simonds Saw & Steel Co., Fitchburg, Mass.

Steelcraft Mfg. Co., Cincinnati, appointed Tolan-McKune Inc., San Francisco, as a dealer in that area for its steel and aluminum windows and other building products.

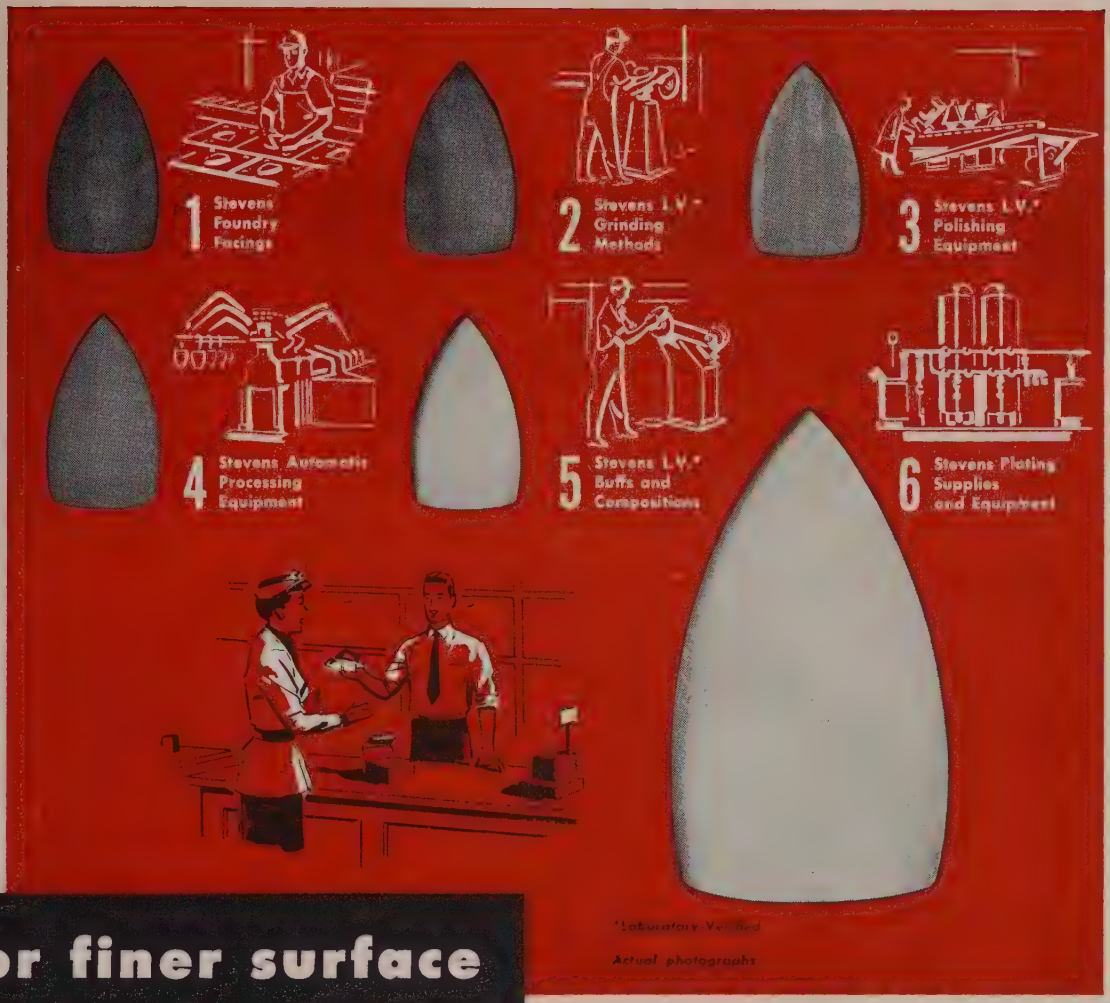
Clevite Corp., parent company of Cleveland Graphite Bronze Co., Cleveland, maker of bearings and bushings, granted rights to Repco Ltd., Australia, for the manufacture of automotive bearings covered by Clevite patents.

NEW ADDRESSES

American Chain & Cable Co. Inc., Bridgeport, Conn., has enlarged warehouse facilities at 890 Tennessee St., San Francisco.

New post office address of **Reserve Mining Co.'s** "taconite town" on the north shore of Lake Superior, 55 miles from Duluth, is officially "Silver Bay, Minn." In the past, the address "Beaver Bay, Minn.," had been used.

Kaiser Steel Corp., Oakland, Calif., established a sales office


1 Stevens Foundry Facings
2 Stevens L.V.* Grinding Methods
3 Stevens L.V.* Polishing Equipment
4 Stevens Automatic Processing Equipment
5 Stevens L.V.* Buffs and Compositions
6 Stevens Plating Supplies and Equipment
*Laboratory-Verified
Actual photographs

For finer surface finishes at EVERY STAGE . . . shop at Stevens

America's modern marketing economy, the supermarket stands symbol of efficiency – offering the most convenient manner buying quality products at competitive cost. Purchasors in foundry and metal finishing fields are recognizing that one-ce "shopping" at Stevens offers them these same advantages. ether your product is stamped, cast, forged or molded – you save time and money and produce a better surface finish by ng Stevens for *all* your equipment and supplies. Not only are assured quality products at a competitive price but, because vens understands your *complete* needs, you benefit from gration of materials to meet your particular requirements. everything from foundry facings to full automatic plating chines, do as the iron manufacturer above has done – investigate value of one-source "shopping" at Stevens. Call your Stevens resentative or write direct.

EDERIC B. STEVENS, INC., Detroit 16, Michigan.

FREDERIC B.
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INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS
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ACCO products

ACCO Registered* Sling Chains

What would it cost you if you dropped this casting?

• How many times a day do you gamble with a heavy load being lifted over expensive machines—or men? If you have ever dropped a load, you know the consequences. Time lost, damages—a general mess.

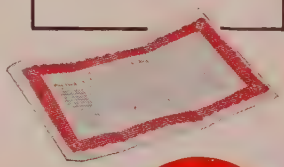
That's why you must be sure of the slings you use. That's why we suggest ACCO *Registered* Sling Chains with their inherent safety. For instance, a ⅜" double ACCO *Registered* Sling Chain used as a double-basket at a 60° angle has a working load limit of 11,400 pounds, almost six tons! Furthermore—it was proof-tested—overall—with a load equivalent to *twelve tons*.

With all this strength, ACCO *Registered* Sling Chains are light in weight . . . easy for your men to handle. That's because they're made of alloy chain which provides strength, great strength, with less weight.

There's much more to tell about these fine ACCO *Registered* Sling Chains. Call your ACCO *Registered* distributor today or write us for literature.

WHAT "ACCO REGISTERED" MEANS . . .

1 The best material
2 Unit safety factor (on bodies, rings, links, hooks)
3 Proof test of complete sling to twice the working load limit
4 Actual field service test of each design
5 Metal identification ring on each sling
6 Signed Registry Certificate with each sling



*Trade Mark Registered

ACCO TRADE MARK

American Chain Division
AMERICAN CHAIN & CABLE

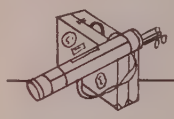
York, Pa., Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

plus Rings Links Hooks

in Denver. The temporary of is located in the Mercantile bu ing, 1031 15th St.; a perma office will be established in Denver Club upon its complet Paul B. Kluthe is the sales re sentative.

Four firms are to occupy former Atlantic Mills property Providence, R. I., as soon a $125,000 renovation project is ished. The firms are **Parisi T Co.**, **Ritz Vanities** and two costu jewerly-making firms, **Berke Mfg.** and **Signa Craft.**

ElectroLift Inc., manufactu of hoists, moved its sales, en neering and manufacturing fa ities to larger quarters at 204 S geant Ave., Clifton, N. J.



VACATIONS

Chase Brass & Copper C Waterbury, Conn., is closing Waterbury Mfg. Co. plant, Ken cott Wire & Cable Co., Waterbu and Cleveland mills for its ann vacation from July 5 to July 9. shipments should be made three weeks starting June 28. O emergency shipments so auth ized should be made.

S. Morgan Smith Co. will closed July 10 to July 18, inc sive. No shipments will be a cepted between July 8 and July inclusive, at plants 1 and 2 York, Pa. Plant No. 3 in Ph adelphia will continue to rece shipments during the vacation p riod.

Garrison Machine Works In Dayton, O., will be closed July to July 26. Three weeks shou be allowed for filling replaceme parts orders and six weeks f new equipment to assure delive before the beginning of the vac tion shutdown.

Waldes Kohinoor Inc., Lo Island City, N. Y., manufactur of retaining rings, grooving too and other products, will be clos for vacation from July 9 to 1 inclusive. The shut-down will i clude all manufacturing depar ments and most offices. The co pany's sales, order and shippi departments will function on

"J&L 1200"

COLD FINISHED CARBON STEEL

Use "J&L 1200" steel on your tough jobs for . . .

tops in quality

tops in machinability

tops in uniformity

tops in finish

available in all standard shapes and sizes

J&L STEEL

It's tops

"J&L 1200" Steel provides the qualities that help machine operators do top-flight work at lower overall costs. With "J&L 1200," the operator obtains: *better machine finishes . . . longer tool life . . . higher rates of speed.* This fact has been proven time and again—in shop after shop.

"J&L 1200" grades meet the compositions published by the A.I.S.I. . . . S.A.E. . . . and Federal Specifications QQS-633.

Try this steel in your own shop. Results will convince you "J&L 1200" deserves to be a regular specification for your production runs.

Jones & Laughlin

STEEL CORPORATION – Pittsburgh

THE
"ACTION" CATALOG

for men of management who are willing to find out how much money these tools can make for their company by simply routing this new "Action" Catalog to Working Heads of Plant Departments.

Not because we say so, but because we sincerely believe that if you do so, your men-on-the-job will tell you how this long-famous line of many-use hand power metal cutting tools will save you money.

Porter Cutters can save hours of labor, reduce shutdown time, solve emergency problems, do the work where other cutting methods are difficult or impossible.

Write for one or more "Action" Catalogs for your plant — or ask your Distributor.

H. K. PORTER, INC.
76 Foley St., Somerville 43, Mass.

limited basis. The order does not apply to the company's branch offices.

ASSOCIATIONS

Walter H. Leo, manager of sales, construction products, Sheffield Steel Corp., Kansas City, Mo., was elected president of **Wire Reinforcement Institute Inc.**, Washington.

John M. Barnhart was appointed executive director of **Industrial Mineral Fiber Institute Inc.**, New York.

J. P. Crosby, vice president, LaPointe Machine Tool Co., Hudson, Mass., was elected president of **American Society of Tool Engineers, Detroit**, succeeding Roger F. Waindle of Muskegon, Mich. Other officers are Dr. H. B. Osborn Jr., Tocco Division, Ohio Crankshaft Co., Cleveland, first vice president; H. C. McMillen, Philco Corp., Bedford, Ind., second vice president; H. E. Collins, Hughes Tool Co., Houston, third vice president; R. C. W. Peterson, Peterson Engineering Co., Toledo, O., treasurer; Wayne Ewing, Arrowsmith Tool & Die Co., Los Angeles, secretary; Harold D. Long Scully-Jones & Co., Chicago, assistant secretary-treasurer.

Concrete Reinforcing Steel Institute, Chicago, presented its 1954 award to Arthur P. Clark, research associate for the American Iron & Steel Institute, New York. Mr Clark received the award for his contribution to the development of the A-305 type of reinforcing bar—the bar now recognized as the American standard for use in present day reinforced concrete construction.

Thomas E. Eagan, chief metallurgist, Cooper-Bessemer Corp., Mt. Vernon, O., was awarded the Joseph S. Seaman gold medal by the **American Foundrymen's Society**, Chicago. The award was presented to him for his work in the development of engineering data on the production and utilization of alloy cast irons. Walter E. Sicha, chief of Cleveland Research Division, Aluminum Co. of America, was awarded the Wm. H. McFadden gold medal for his extensive work on light metal casting alloys.

Purchasing Agents Elect Executive Committee

Members of executive committee of National Association of Purchasing Agents, New York, elected at the annual meeting in Chicago, are shown above. Left to right, first row: Henry L. Ruf, Parkersburg-Aetna Corp., Parkersburg, W. Va.; E. F. Andrews, Pitman-Moore Co., Indianapolis; G. W. Howard Ahl, Philip Morris & Co. Ltd. Inc., New York; H. E. Kaiser, Phillips Petroleum Co., Bartlesville, Okla.; Donald R. Coultrip, Dow Corning Corp., Midland, Mich. Back row: Carl A. Tootill, Van Norman Co., Springfield, Mass.; A. L. Francis, Goodyear Tire & Rubber Co. of Canada Ltd., New Toronto, Ont.; F. G. Syburg, Chain Belt Co., Milwaukee; E. O. Haymond, Shell Oil Co., Portland, Oreg.; W. G. Joyce, City of Memphis, Memphis, Tenn.; F. E. Whyte, Carborundum Co., Niagara Falls, N. Y.

How JESSOP'S pride in a Fine Steel Product helps make it a Better Buy for you

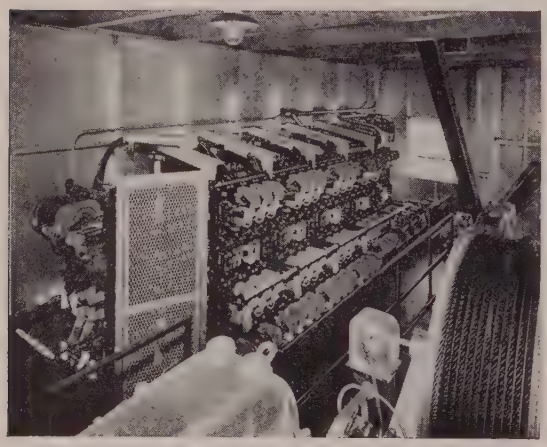
Of all the fine specialty steel products produced at Jessop, none is closer to the hearts of Jessop men than tool steel in the form of precision ground flat stock shown here. So much care is taken that this product will reflect Jessop's ability, that even the splendid new building in which each piece is processed, wrapped and stored is reminiscent of a research laboratory. As a customer, here's how you profit by this expression of pride. You can be completely confident of the utmost accuracy of size, finish and analysis. You can be sure of fast service, even on special sizes, because *Jessop always carries an extensive stock on hand for immediate delivery.* If you think you might have an application for *Truform* oil or *Windsor* air hardening precision ground flat stock in the realm of dies, gages, cutters, machine parts, straight edges, or the like, write for literature. If not, show this ad to a friend who might. No one can go wrong by dealing with Jessop.

JESSOP STEEL COMPANY
SPECIALTY STEELS

JESSOP

STEEL COMPANY · WASHINGTON, PA.

KING SIZE Barge-Crane shown with 62½-Long Ton Test Load on 50-Long Ton Floating Crane. Built by Wiley Mfg. Co., Port Deposit, Md.



View above shows EC&M Crane Protective Panel at left, row of EC&M Magnetic Controllers with the well-known LINE-ARC Contactors and TIME-CURRENT Relays, and EC&M Cam Master Switches (arranged for remote operation) at the extreme right. Adjacent to the hoist drum in the foreground is an EC&M Rotating Cam Limit Switch and beyond this an EC&M Type WB Brake partially shows.

Wiley Manufacturing Company takes advantage of the inherent safety and quick response in operation of series-wound brakes and the simplicity and excellent characteristics of series motors for the main, auxiliary and whip-hoists and luffing motion of their barge-cranes.

The EC&M Wright Dynamic Lowering Circuit Controller used on these motions prevents heavy peak loads on the Diesel Generator, because:

(1) ALL line current passes through the brake coil on the first point lowering, giving quick brake release with minimum power.

(2) EC&M TIME CURRENT Relays retard the rate of acceleration of heavy loads in hoisting, yet allow faster operation with light loads. And for rotating the crane, TIME-CURRENT Relays govern the rate of acceleration of the swing motion with topmost smoothness.

Specify EC&M Control to get these exclusive advantages.

1761

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street ★ Cleveland 4, Ohio

Technical Outlook

NUCLEAR POWER—What are private companies doing in this field? R. H. Davis, manager, marine division, Worthington Corp., outlines his firm's activities: "One project is the analysis and design for the many hydraulic and fluid friction problems in an improved, hermetically-sealed, canned-motor, primary coolant pump. Other projects involve stationary and portable nuclear power plants."

BRAZING—Two brazing alloys for molybdenum for use at elevated temperatures show promise. An 84 per cent nickel—16 per cent titanium alloy and a 52 per cent niobium—48 per cent nickel alloy indicate satisfactory service at 1800° F in vacuum for 24 hours, according to NACA. Tensiles are in the 17,000 to 19,000-psi range.

AUTOMATION—Jets of air measure wall and base thickness of copper-clad bullet jacket cups in one operation at Superior Steel Corp. Said to be accurate for close tolerance work, the automatic sorting gage augments manual gaging—previously used exclusively. Features include a pneumatic feeding mechanism. Cups "walk" up an incline and arrange themselves in uniform position before sliding down the gravity chute. A pneumatic cylinder, timed to operate at 2500 pieces an hour, brings cups into gaging position.

THE BIG HEAT—McLouth Steel Co. made history last week when they poured the first heat from the first of their two new 200-ton Heroult electric arc furnaces. Built by American Bridge, these units are 50 tons larger than any known existing furnaces in the electric steel industry.

VACUUM PROCESSING—Auto builders are taking a good look at zinc die castings and steel stampings vacuum metallized with aluminum as a substitute for bright chrome-plated parts. A manufacturer of zinc die cast bicycle horns converted to vacuum aluminum metallizing and found that costs were about one-sixth that for electroplating, largely because buffing and polishing weren't required to get a high-luster finish.

SHELL MOLDING—You can save up to 50 per cent in resin content by using a new process to pre-coat sand, according to Bakelite. A thin film of resin is formed around each sand particle before shells are formed, resulting in a faster melt, faster flow and faster bond than previous resin-sand mixtures, they say. Resin BRQ-12244 coats sand in a molten state without danger of hardening before the production heating cycle. A catalyst in aqueous solution, which is added after the sand is coated, brings about the reaction that hardens the resin to bond the sand layer in the shape of a casting mold.

CERMETS—A flash-sintering process is being used to produce turbo-jet engine blades and other temperature-resistant components. Metal powder mixtures are heated rapidly through direct passage of high-amperage current with a simultaneous application of high pressure on the die. Details are set out in a Wright Air Development Center paper published by the Department of Commerce.

MORE TITANIUM—Pistons for the M-39 aircraft cannon are being machined from titanium bar stock at Pontiac Motors Division, General Motors Corp. Operations performed are: Cutoff, turn, drill, grind and lap. Touchiest of all operations is the grind. Tendency is to load wheel. Supervisor of the line states that in titanium grinding, the coolant is critical. Soluble oil can be used, but his recommendation is to use a mixture of 10 to 15 parts oil to 1 water instead of 20 to 1. Piston is roughly 1½ inches in diameter and 5 inches long.

etalworking Outlook—p. 55 *Market Outlook—p. 161*

COST COMPARISON

(Two Circumferential Welds Joining Heads To Tank Body)

AUTOMATIC AIRCOMATIC				STICK ELECTRODE		
Shielding Gas 2% Oxy-Argon 39 cu ft per hour	Wire A-675 9.36 lb per hour	Labor and Overhead $3.00 per hour	Aircomatic Cost per Tank	Electrode Cost per Tank	Labor and Overhead $3.00 per hour	Electrode E6012
1.61 cu ft per tank	0.39 lb per tank	0.0625 hr per tank	$0.51	$0.86	0.25 hr per tank	0.8 lb per tank
$0.18 per tank	$0.14 per tank	$0.19 per tank			$0.75 per tank	$0.11 per tank
INERT GAS at $0.111 per cubic foot				ELECTRODES at $0.14 per pound		
WIRE at $0.34 per pound						

Fig. 1—Breakdown of unit costs for each process

INERT-GAS SHIELDED WELDING

Proves Cost Saver O

West Coast fabricator finds material costs are higher, but lower unit labor costs more than make up the difference. One man has replaced three stick welders

PRODUCTION of electric household hot water tanks is a highly competitive field, and the reduction of manufacturing costs in this industry as in most others is always the goal of the production department. Development of the automatic Aircomatic* for mild steel welding has proved to be a shop tool that helps reduce production cost in a period when most operating costs are increasing.

The factors that make this possible are high speed welding and elimination of several production stages. High-speed welding cuts costs in this way. Labor and overhead are reduced 65 per cent on the joints where Aircomatic is used. One man using the method has replaced three stick rod welders. A secondary benefit is the uniformly excellent weld appearance as compared to stick electrode welding.

*Trade name.

Case Study — At Collins Concrete and Steel Pipe Co., Portland, Oreg., elimination of several production stages is accounted for in this way. First, the application of spatter-proof is no longer necessary with the Aircomatic process and secondly, slag free Aircomatic welds eliminate the need for costly slag removal.

The chart, Fig. 1, shows a cost comparison of the inert gas process versus stick rod on that portion of the heater that is now being welded with the automatic method. Such factors as reduced shop space, less handling and fewer production operations, while very important to the user, are not considered in this cost comparison.

Real Savings—There is a saving of $0.35 per tank welded and on an average monthly production of 1600 tanks this firm saves $560 in direct production cost.

Figure 2 shows the complete welding booth. Note directly under the welding unit, one head has been welded, and by simply rolling the unit along the jig the second head can be welded.

Smooth Joint—A cross section of the joint design is shown in Fig. 3. With this design the weld fills the groove and the finished product is almost flat. Figure 4 shows this condition. Here too can be seen a group of tanks that have been galvanized following Aircomatic welding and testing. The testing on all tanks, from 14 to 66-gallon size, is a 125-pound air pressure test.

Welding conditions are as follows:

Current — 360 Amps. DCRP (Supplied by 400 Amp. DC Bumblebee).

Voltage—26 Arc volts.

Shielding Gas—39 cubic ft per hr (2% Oxy-Argon mixture).

By W. L. WYMAN
Technical Representative
Air Reduction Pacific Co.

;teel Tanks

Fig. 2—Automatic unit welds first one head, then is rolled along the jig to reach second head. Tank rests on a rotating positioner which turns at about 10 ipm

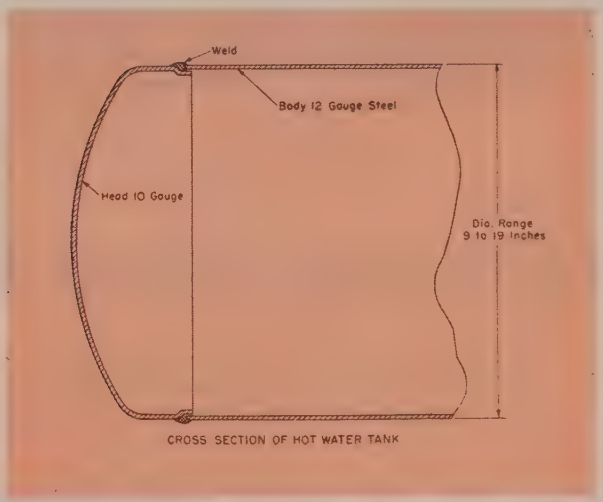


Fig. 3—Cross section of a tank shows joint design

Fig. 4—Group of finished tanks waiting for shipment

Wire — 1/16" diameter at 175 :hes per minute (A675).

Welding Speed—41 inches per nute.

Collins is at present using about 0 pounds of wire per month and ture expansion of this automat- welding on gage thickness mild eel is expected.

Future Look—Competition con- onting the inert-gas metal arc ocess in the carbon steel field distinctly different from that countered with the "hard to eld" metals such as aluminum, ainless, copper, etc. Steel, how- er, is not hard to weld. Tech- ques and procedures have been veloped for conventional proc- ses to the point where it is dif- ult for a relatively new process gain a foothold on a cost if not quality basis.

Notwithstanding, demands to ake its speed of deposition avail- ble in this large market have led to applications which indicate the process will overcome most of the cost and mechanical problems. Advantages of the process for steel are increased welding duty cycle, elimination of slag removal, reduced plate edge preparation, and elimination of electrode stub.

The old and the new rolling ingots posed side by side, left, graphically testify to the progress of flat-rolled magnesium products. Photo at the right shows automatic cutoff saw at work beneath continuous casting unit

Magnesium Widens Its Sheet Rolling Limits

Getting ingots big enough was the real stopper. Dow solved that one and the rolling problems with new facilities at Madison, Ill. You can buy six-foot widths now

By VANCE BELL
Assistant Managing Editor

THE MAN who thinks there is nothing new under the sun hasn't been in the Dow Chemical Co.'s magnesium plant at Madison, Ill.

A visit there would show him that the rolling mills are starting to turn out magnesium sheets wider than ever before. The old 4-foot width has been eclipsed by a new width of 6 feet. What's more, wide sheet is being turned out in coil form, if you want it that way.

A Natural—Dow's move to produce a wider sheet is a natural one. American industry has pushed steadily toward lightening the weight of its products. In turn this has given major stature to light, flat-rolled products in the steel industry and to wide sheets in the aluminum industry. Where a solid bar of metal would have been used in the old days, a tube formed from strip can now be used.

Too, the trend toward continuous and automatic industrial production has built a demand for metal in coils.

In magnesium, Dow had the lightness. But it didn't have the width of product it wanted and it couldn't provide long coils. It was limited by two things in this young industry. One, it lacked a mill wide enough to do the job. Two, there weren't any ingots large enough to make wide sheets or sheets in long coils.

Stoppers—It was easy enough to obtain a wide mill, but the stoppers were scarcity of knowledge about rolling wide and long sheet and plate of magnesium and lack of source of sufficiently large magnesium ingots.

Until now, the largest magnesium rolling ingots weighed only about 250 pounds. They were produced by the continuous casting method by which Dow made billets for its extrusion presses. Dow found it could develop a process of continuous casting to produce a 2000-pound rolling ingot. Now ingots of that size flow out regularly at the Madison plant.

Production of large, individual ingots such as is commonplace in the steel industry has not proved practical for all alloys in the magnesium industry. Magnesium cast in that manner is subject to a higher metal loss between the ingot and the finished rolled product.

Dow's Madison division plant, which is just across the Mississippi river from St. Louis, has three continuous casting units. One produces rolling ingots, or slabs, and the other two produce extrusion ingots.

Slab-Shape Ingots — The 2000-

nd magnesium rolling ingots
ing from Dow's continuous
er at Madison are of slab shape
measure 11 x 41 x 76 inches.
thin, longitudinal edges of the
ot are convex. The other four
faces are flat.

When the solidified ingot has
ved downward from the casting
d a sufficient distance, an elec-
eye turns on a circular saw
ch cuts it off, usually to a
gth of 76 inches.

The ingot is then moved to a
lper where surface imperfec-
ns are removed. Next, comes a
-fired oven where it is exposed
a gas flame. Upon leaving the
n flame section of the oven, the
ot moves into a recirculating
air chamber where it is held
il needed on the 84-inch revers-
hot rolling mill. Upon emerg-
from the oven, the ingot's
perature is 800° F.

Roll Sizes—The hot mill, elec-
ally driven by 6000 horsepower,
4-high, single stand. Two work-
rolls are 84 inches long and 27
hes in diameter. Each of the
o backing-up rolls are 84 inches
g and 53 inches in diameter.

This hot mill will reduce ingots
m a 10-inch thickness down to
t-rolled plate or sheet of less
an a quarter of an inch in thick-
ss. If plates are the desired
oduct from this mill, they are
eared to length on the run-out
ble. If a coil is desired, a coil
x in the run-out table engages
e leading end and winds up the
aterial. Coils can be further hot
lled on the mill to a minimum
ge of 0.051 inch.

Four Finishing Mills — For further reduction of plate and sheet after they come from the hot mill are four finishing mills, all of which are single stand, four-high. Roll widths of the four finishing mills are 84, 68, 36, and 18 inches. All of the four finishing mills are capable of rolling coil, and some of them can roll plate.

The 84-inch hot mill, the 84-inch finishing mill and the 36-inch mill are new. The 68-inch mill and the 18-inch mill came from Dow's plant at Midland, Mich.

Also at the Madison plant is a 66-inch sheet rolling mill owned by the Air Force.

Coil Size—The maximum size coil of magnesium sheet from the new facilities at Madison is 72 inches wide and weighs approximately 1950 pounds. Inside diameter of coils is 22 inches, except where coils come from the 18-inch mill. Those have a smaller ID.

In addition to three furnaces for heating ingots are four furnaces for annealing coils between finish rollings.

Flat sheet and plate up to 1 inch in thickness can go through a continuous pickler for various surface treatments.

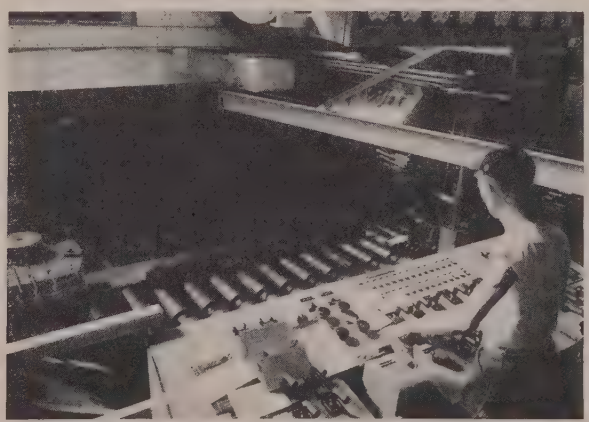
Installation of the new sheet mills makes Dow's Madison plant a well integrated wrought magnesium center. In addition to producing sheet and plate, the plant makes extrusions and alloys magnesium ingots for foundries.

Makes Extrusions, Too — The plant has six extrusion presses. One has a 5500-ton capacity, two have a 3000-ton capacity each, two have a 1700-ton capacity each, and one has a 250-ton capacity. To be installed is a 13,200-ton extrusion press from Germany. It had been partially built for installation there during World War II. Dow engineers have improved the design of the German press which is expected to be in operation in mid-1955, and will make large magnesium extrusions, such as structural sections. In addition to making shape extrusions, it also will make stock for forging and other extrusion operations.

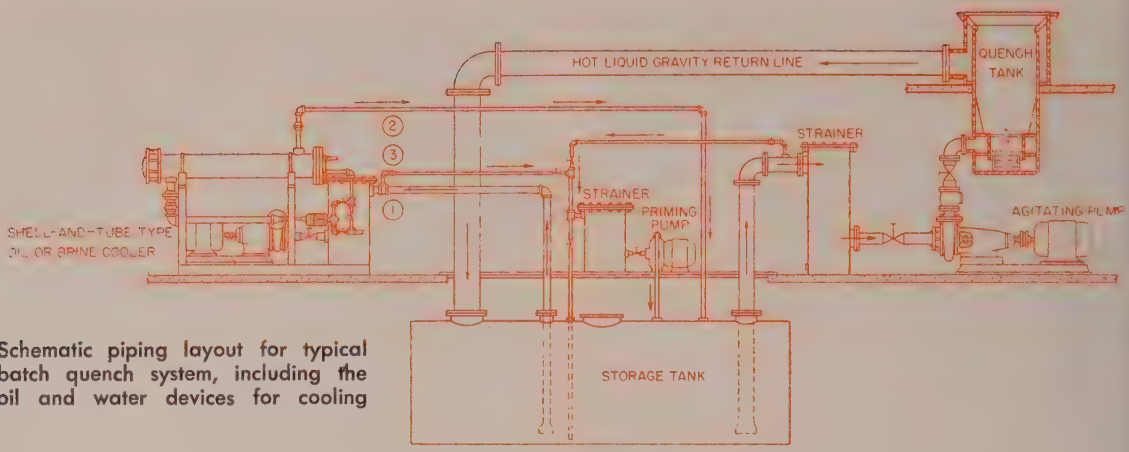
Magnesium Center—To accommodate the giant German press, Dow added on to its gigantic plant at Madison. The plant has 1.5 million square feet of floor area. The government built the plant during World War II as a place to produce armor plate. In January, 1951, Dow bought the building. It will house all Dow's magnesium mill product operations except die casting, which will remain at Midland, Mich., and a foundry at Bay City, Mich.

The alloying department at Madison not only makes ingot for foundries but it operates the continuous casters that turn out ingots for the rolling mills and round ingots for the extrusion presses. The Madison plant adds the right amounts of alloying materials to magnesium that arrives either in the form of pigs or scrap. The pigs, which comprise the plant's principal source of metal, come from Dow's Freeport, Tex., reduction plant, where raw materials extracted from sea water are turned into magnesium.

he one-ton ingots are scalped to remove surface scale nd roughness prior to their heatup for rolling passes



This 84-inch reversing 4-high single stand mill is part of the new rolling facilities for flat products



Schematic piping layout for typical batch quench system, including the oil and water devices for cooling

FUNDAMENTALS OF QUENCHING—PART 1

Design for Batch

Batch handling puts terrific load on quench system. To get full and uniform hardness in all pieces, layout of the system must be thorough. Equipment must be right size

COMMERCIAL heat treaters have long recognized that precisely-controlled quenching is as important as accurately-controlled heating in hardening many types of steel parts.

Now, commercial shops and private industry are making extensive use of hardening furnaces of the vertical, cylindrical, radiant-heated and high-temperature, forced-convection types, such as the Lindberg Super Cyclone. Photo, p. 112, shows a typical load being removed from this type furnace.

Work pieces are generally loaded in quantity on a cast, heat-resisting alloy fixture. After reaching hardening temperature and soaking, the charge is quenched directly in the fixture. Net furnace loads of 2000 to 3000 pounds or more are common.

Limits—Such batch handling is practical and convenient, but it imposes a tremendous burden on the quench system. To get full and uniform hardness in all pieces in a densely-packed fixture, layout of quench equipment must be thorough and all items must be of appropriate size. This article touches on some major points of layout.

Other important issues not discussed include the selection of a medium (oil, water or brine) and the type of oil or brine used. These questions are generally answered by steel company technical staffs or plant metallurgists.

In general, brine ranks highest in rate of cooling, water next and then oil. The least severe quench that will develop required hardness should be selected. This will assure minimum distortion and reduce susceptibility to cracking in pieces that have radical variations in section thickness.

In Common—Regardless of the quench medium used, the fundamental principles of properly engineered batch quench systems are similar.

As you see in above sketch, th system in general will require:

1. A cylindrical quench tank o the right size and design, such a the Bell & Gossett distributor-typ tanks.

2. One or more motor-driven cen trifugal agitating pumps to circu late the quench medium throug the tank during quenching.

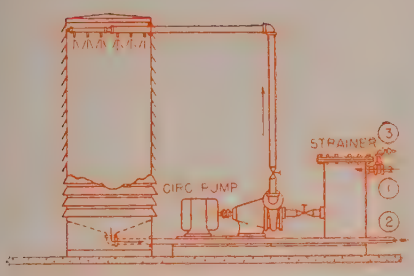
3. An auxiliary storage tank— to provide sufficient volume o "flywheel" effect in the system.

4. A cooling device or othe means—to restore quench mediu temperature between quenches.

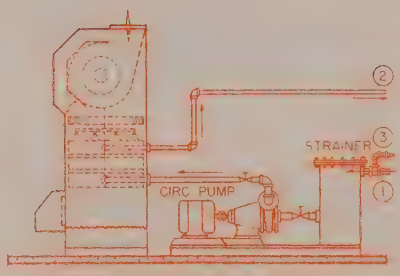
5. Also miscellaneous circulatin pumps, positive displacement prim ing pump, strainers, check valve globe valves, etc.

Special Points—Careful consider ation must be given to three as pects of the system.

First, agitation in the syster must be adequate to carry awa heat energy from the load (a least as rapidly as it gives up thi



SPRAY TOWER TYPE WATER COOLER



EVAPORATIVE TYPE OIL OR BRINE COOLER

Number 3 in STEEL's

MODERN HEAT TREATING SERIES

Treatment Systems

By ALEXANDER J. JAREMA
Sales and Development Engineer
Lindberg Engineering Co.
Chicago

energy to the quench fluid); and sufficient turbulence must exist within the quench tank to carry away oil vapor or water vapor bubbles—eliminating local soft spots on the surface of the pieces.

Second, flywheel effect must be provided in the entire system. Purpose is to absorb all heat energy within the charge and quenching fixture without exceeding a prescribed or assumed rise in quench medium temperature.

Third, temperature of the quench medium must be restored between quenches. In water systems, this might be done by controlled overflowing of plant water. In water-scarce areas, water spray cooling towers can be used economically. For brine and oil quench systems, the cooling device is generally an external shell-and-tube type heat exchanger or an external evaporative-type cooler. The decision on type should be based on availability and cost of plant water versus first cost and operating expense.

Quench Tank Size—Probably the first point to be settled is size and approximate volume of the quench tank. It should be held as small as possible, while allowing adequate clearance (in diameter and depth) for the largest fixture anticipated.

Agitating Pump — Knowing the approximate volume of the quench tank, this is the next most logical item to size. One of two conditions may establish the minimum pump capacity, and both should be calculated.

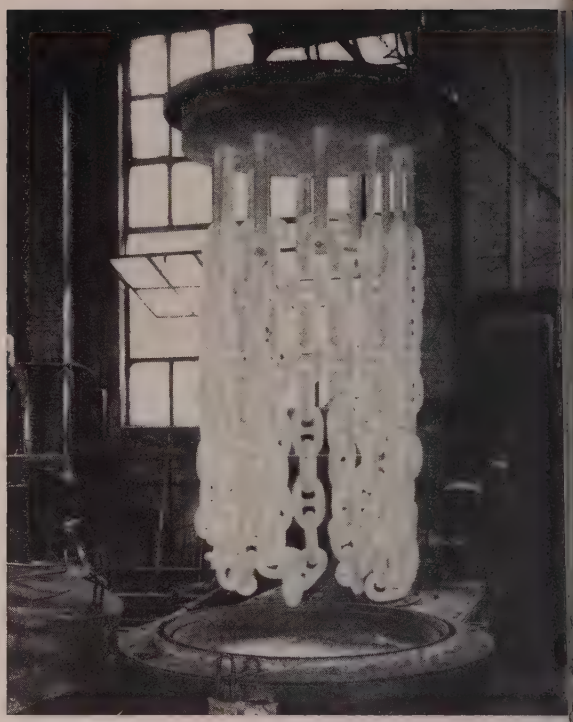
Condition No. 1 — The quench medium must be circulated through the system fast enough to carry away heat from the parts at a certain minimum rate. A rule-of-thumb rate can be taken as ½-inch penetration per minute for sections of 4-inch thickness and under. Since cooling takes place from both sides of a flat section, or radially inward in a round, the minimum cooling rate comes to 1 inch of thickness per minute for flat sections or 1 inch of diameter per minute for rounds.

So the allowable time for removing heat from the charge is established by average section thickness. For example, assume that a 1000-pound load of 2-inch diameter shafts is a typical charge. Diameter dictates the maximum cooling time at 2 minutes.

Next, gross charge weight must be known (or accurately assumed), as well as heat content at hardening temperature. For usual hardening temperatures in the range of 1600° F, the heat content above 150° F (assumed end quench temperature) may be taken as 240 Btu per pound. Gross charge weight times this figure gives the total Btu to be extracted from the charge by the quench medium.

Example—Say the weight of the quenching fixture is 500 pounds. The gross charge weight will be

This is a typical quenching fixture used for the mass handling of parts. It is cast 35-15 chrome-nickel



Here a typical load is being lifted from a high-temperature, forced-convection type of quench furnace

about 1500 pounds (shafts weigh 1000 pounds). Fifteen hundred pounds times 240 Btu per pound gives 360,000 Btu to be extracted from the charge by the quench medium. With an allowable time of 2 minutes for the 2-inch diameter shafts, the quench medium must be circulated to extract 360,000 Btu in 2 minutes or 180,000 Btu per minute.

Now, we can find the circulation or agitation rate. Allowable temperature rise of oil, water or brine during quenching can usually be assumed at 30° F (120° F at start of quench, 150° F at end). Each gallon of oil circulated will carry off 113 Btu, each gallon of water or brine about 250 Btu.

Divide 180,000 Btu per minute by 113 Btu per gallon to find the minimum oil agitation rate, which is 1600 gpm. If quench was water or brine, 180,000 Btu per minute divided by 250 Btu per gallon would set the minimum rate at 720 gpm.

Condition No. 2—But the above heat removal circulation rate may not produce the required turbulence. Function of turbulence is to assure rapid removal of oil vapor or water vapor bubbles from the surface of the work pieces.

Generally, it may be assumed that a circulation rate of 2 to 3 quench tank changes per minute will afford required turbulence. If, for example, the quench tank volume is 250 gallons, an agitation rate of 500 to 750 gpm can be assumed to insure turbulence.

In our example, the heat removal circulation rate of oil exceeds the minimum rate for turbulent flow, and agitating pump capacity would have to be 1600 gpm. If the quench were to be water or brine, the heat removal rate (720 gpm) is essentially equal to that required for turbulence (500 to 750 gpm), and an agitating pump providing about 750 gpm would be adequate.

Storage Tank Size — Now you should consider the auxiliary quench medium storage tank. Without becoming concerned over the relatively small volume within the cooling device and miscellaneous runs of pipe, it can be stated: The combined volume of the quench tank and auxiliary storage tank must be capable of absorbing the entire heat content of the gross charge, without exceeding a certain prescribed or assumed rise in quench medium temperature. Unless some specific requirement is set up, this may be assumed at 30° F.

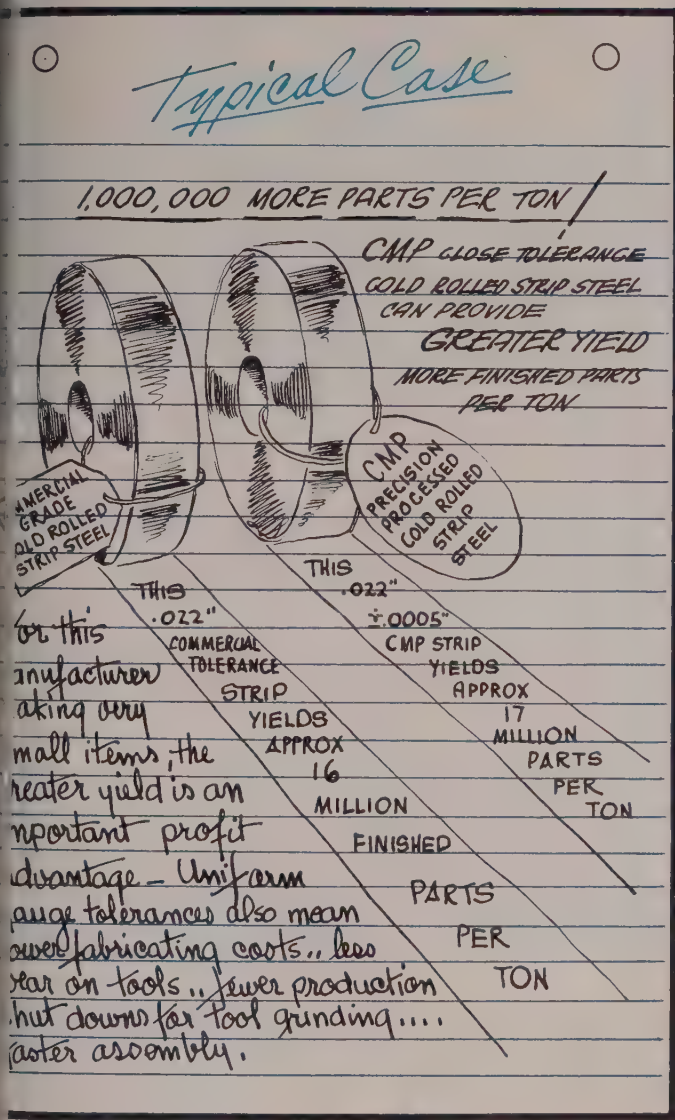
To continue the example, you recall that 360,000 Btu is the total heat energy to be absorbed by the quench medium in any one quench. One gallon of oil (in rising from 120° F to 150° F) will pick up 113 Btu. So the entire quench system must contain 360,000 Btu divided by 113 Btu per gallon or about 3200 gallons. Since the quench tank holds 250 gallons, the storage tank will have to hold about 2950 gallons.

For water or brine quenching, each gallon of quench medium (rising from 120 to 150° F) will accept about 250 Btu. So, if the quench were water or brine, 360,000 Btu divided by 250 Btu per gallon gives about 1450 gallons required in the entire quench system. Since the quench tank proper has been estimated at 250 gallons, the auxiliary storage tank would have to hold about 1200 gallons.

This is the first of two articles on the subject by Mr. Jarema. Concluding article will appear in next week's issue of STEEL.

CMP COLD ROLLED STRIP STEEL OFFERS

some realistic ways . . .


Typical Case
1,000,000 MORE PARTS PER TON
CMP CLOSE TOLERANCE COLD ROLLED STRIP STEEL CAN PROVIDE GREATER YIELD MORE FINISHED PARTS PER TON
CMP PRECISION PROCESSED COLD ROLLED STRIP STEEL
THIS .022" ±.0005" CMP STRIP YIELDS APPROX 17 MILLION PARTS PER TON
THIS .022" COMMERCIAL TOLERANCE STRIP YIELDS APPROX 16 MILLION FINISHED PARTS PER TON
Or this
inufacturer
aking very
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nportant profit
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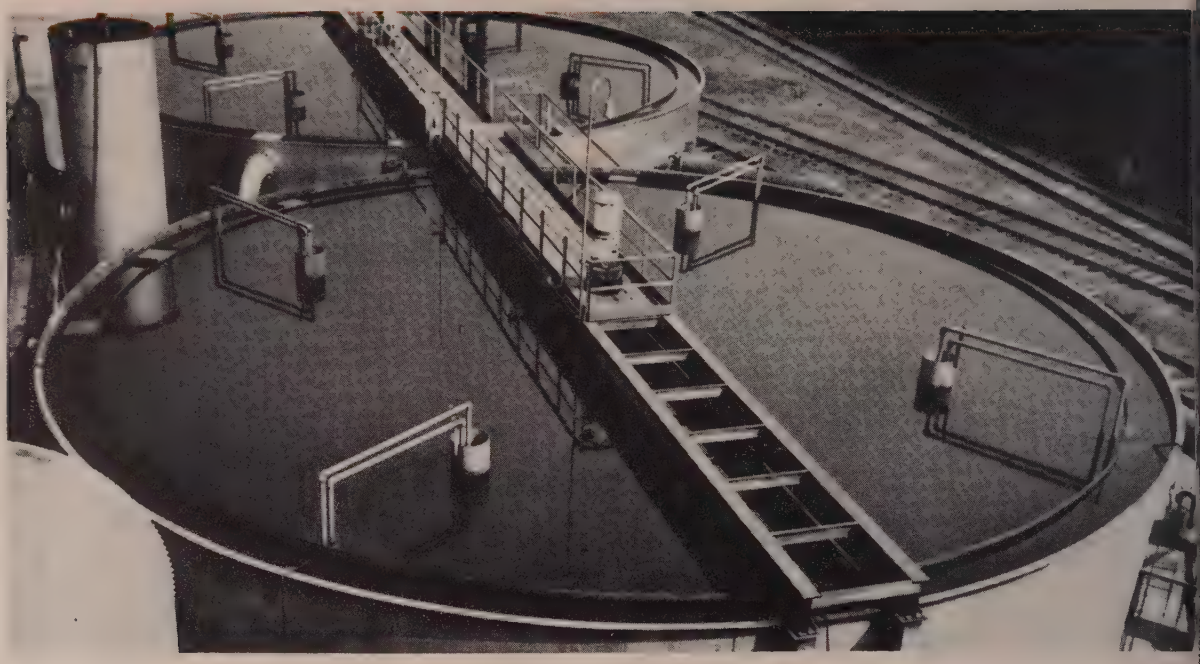

These two Cochrane reactors, the raw water mixing stand pipe (upper left), the concentrated acid storage tank and the equalizing tank are the only components of the water treatment plant that are not under roof

PUSHBUTTON WATER DEMINERALIZATION

Accelerates Tinplate Production

Two men operate an automatic system that turns out seven million gallons of clarified and one million gallons of demineralized water every day at J & L, Aliquippa

By JOHN K. SARGENT
Technical Advisor, Tin Plate Department
Jones & Laughlin Steel Corp.
(Aliquippa)

AND

J. W. STEWART
Chief Project Engineer
Cochrane Corp.
Philadelphia

WITH the help of 86 automatic valves, one operator and an assistant can operate the entire water treating plant which supplies consistently good water in the quantities required by the vast tin plate facilities at Jones & Laughlin Steel Corp., Aliquippa, Pa.

Results were gratifying. This is borne out by accelerated production of tin plate and elimination of boiler plant and production problems involved in the use of steam condensate. As for Ohio river water, turbidity is reduced 100 per cent, hardness 99.8 per cent and dissolved solids 99.67 per cent.

Twin Reactors—To accomplish these results, river water is pumped through three Hellan strainers to a mixing stand pipe at the rate of 5000 gpm. Flow is then divided between two Cochrane round, steel reactors. Flow to each reactor is measured, recorded and integrated, and an electric contact counter operates alum, lime or caustic soda and clay feeders. Thus, the flocculating chemicals, introduced ahead of the mixing stand pipe, are fed in proportion to flow.

Clarified settled water with a turbidity of less than 10, flows by gravity to a 50,000 gallon surge tank. Approximately 4250 gpm is pumped to the tin mill for general purpose uses and preplating operations. The remainder is pumped at the rate of 750 gpm to the pressure filters and demineralizers for further treatment. A pneumatically operated valve automatically permits a portion of the water to recirculate to the surge tank to prevent delivery of pressures in excess of 50 psi.

Push-Button Demineralization—

rts made of tough ANACONDA Phosphor Bronze wear better, last longer

alloys are available in sheets, tes, strips, wire, rods, bars and mless tubes.

nstant wear and flexings. Periodic sses. Fatigue and corrosion. These the things that can knock machine ts out of commission. But they 't hurt those shown above.

Here's why. All of them are made ANACONDA Phosphor Bronze oys. And these copper-tin alloys strong and tough. They are non-gnetic. They conduct heat and ctricity well. And you can work em easily.

In bushings, gears and bearings Phosphor Bronze doggedly resists abrasion. In switches, springs, diaphragms and electrical contacts it keeps its high elasticity under conditions where less rugged alloys fail.

ANACONDA Prosphor Bronze comes in 10 standard compositions (including a free-cutting alloy). Tin content ranges from 1.25% to 10.0%.

Quality? Our record speaks for itself—a recent study of sheet metal covering two years' production shows that claimed unsuitable quality was at the amazingly low ratio of 400 pounds per million pounds shipped.

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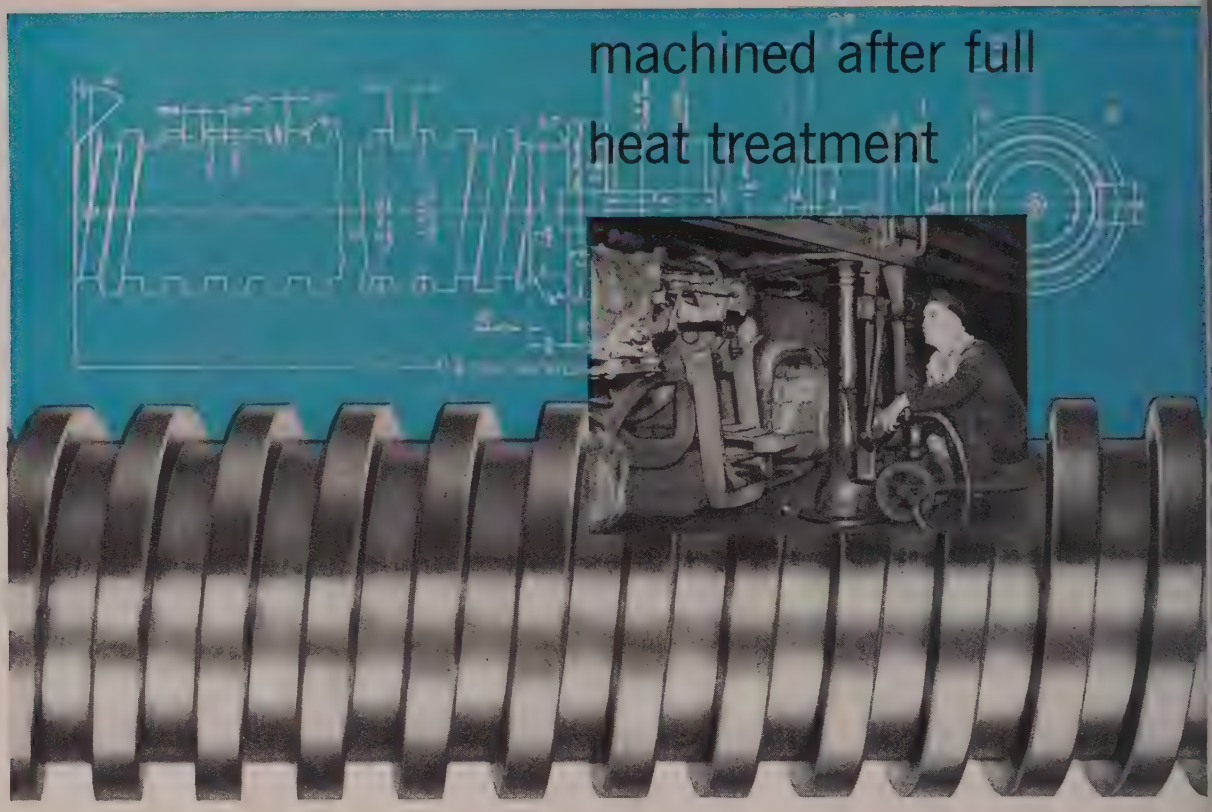
MAX-EL alloy steel part for 100-ton jack machined after full heat treatment



The Max-el part shown above is the lifting screw from a Duff-Norton air motor screw jack. It's the part that actually lifts and holds the load . . . up to 100 tons.

To make the part, blanks are cut from Max-el 3½ bar stock. After heat treating to 321-341 Brinell, threads are chased and all machining performed. Max-el's optimum machinability after heat treatment, its high-strength, toughness, deep hardenability — which prevents thread sinkage, and high surface finish make it an ideal choice for this rugged application.

But try Max-el yourself. Its excellent machinability means longer tool life, more pieces per grind. And you'll appreciate its freedom from distortion and superior quality. For immediate delivery of Max-el call your nearest Crucible representative.

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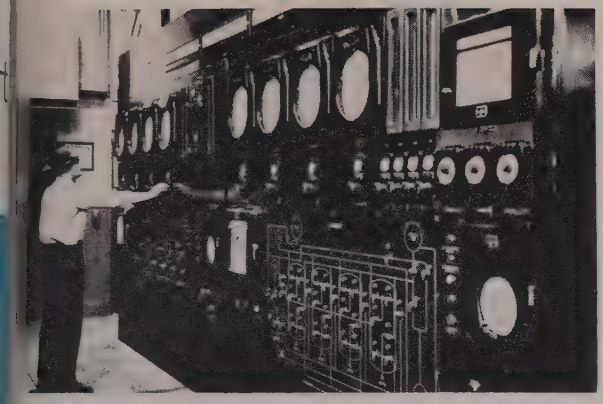
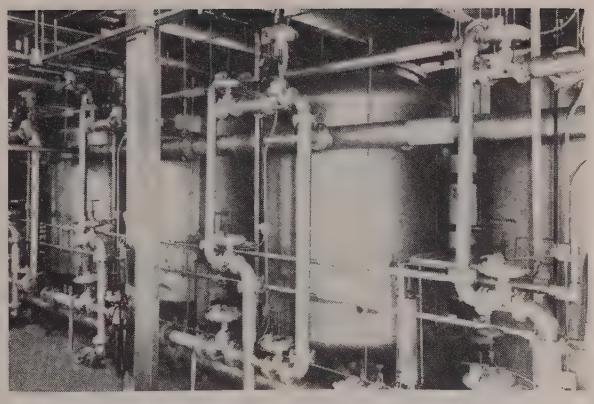


he demineralizer control panel is unique in its schemic flow diagrams with valve stations and indicating ghts. Anion controls are at left; cation panel right



View shows maze of lines that serve the anion exchange units (large tanks). All valves are remote controlled; influent valves are all equipped for throttling service

The five filters preceding the demineralizer (to keep the ion-exchange resins clean) are equipped with manually controlled gate valves. Automatic control is not used here because backwashing of each filter is only required once every 24 hours and no difficulty is experienced in correctly manipulating the rather simple five-valve tests. Rinse water and backwash water are recovered and returned to the inlets of the reactors.

In contrast to the pressure filters, the cation and anion exchange units of the demineralizer are almost completely automatic except for adjustments of air pressure regulators and push-button starting of regenerating or operating cycles. Since intermixing of fluids is critical at this point and tight shut-off is required, Saunders type valves with Honeywell diaphragm motor operators are used throughout. These are springless type operators with a constant applied air pressure of 40 to 45 psi and operating air pressure of 50 psi.

Check Spot—Sodium is the first cation to "leak through" as the resin approaches exhaustion. Routine flame photometer sodium tests readily determine which unit needs regeneration. Operator starts the regenerating cycle by simply pushing the appropriate button. The cycle controller then takes over. The first step is backwashing at 384 gpm for 10 minutes, controlled by a throttling valve on the common backwash and rinse header and on-off valves on each unit. Coagulated but unfiltered water is used and then discharged to waste neutralization system.

Next, reclaimed acid is pumped through the unit at the rate of 300 gpm and discharged to the neutralization system. Because the Ohio river is very low in alkalinity, a considerable excess of acid must be used to regenerate the hydrogen zeolite; consequently, costs are lowered considerably simply by the reclaiming of acid. The acid pump is started by a pressure switch actuated by the acid controller and stopped by a low level probe in the acid reclaiming tank.

Gradient Regeneration — Gradient acid regeneration takes place with acid varying from a two to an eight per cent solution. Assuming that all the valve positioners are correctly set, the operator need not touch any of the equipment after pushing the starting button.

When the cycle controller sets the valves for gradient regeneration, a rotary valve with positioner regulates the flow of reactor effluent to the acid mixing chamber at a fairly constant rate of 200 gpm which is varied slightly in accordance with conductivity measurements on the diluted acid. Flow of concentrated acid is controlled by a throttling valve with a positioner.

Acid Flow Control—The air signal to the positioner is varied from 17 to 3 psi by means of a solenoid on-off valve and a needle valve which bleeds the air from an air loading tank when the solenoid valve is opened. Bleeding of the air in the tank gradually decreases the air pressure to the acid valve positioner, which, in turn, positions the valve to permit a greater flow of acid.

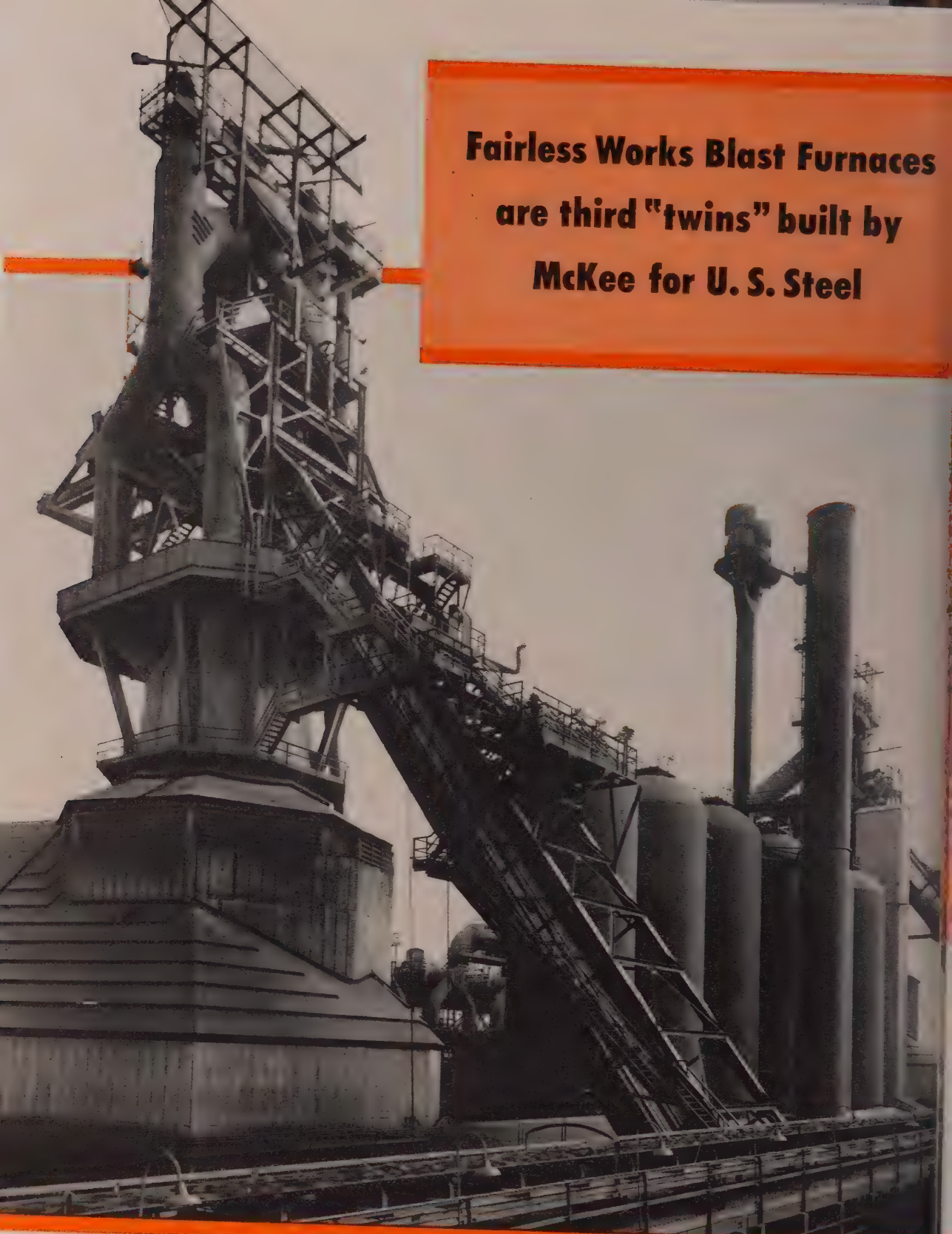
To maintain a constant head on the acid, another automatic valve in the system permits acid to recirculate from the acid pump back to the concentrated acid storage tank. Amount of acid is measured and integrated, and the concentrated acid system is shut down after a preset flow.

Water Dilution—The rotary water valve is allowed to remain open for a preset time to allow the eight per cent acid to clear the resin bed at a constant flow rate of 200 gpm. This slow rinse portion of the cycle also serves to flush out the dilute acid system. All on-off control valves in contact with concentrated acid are glass-lined.

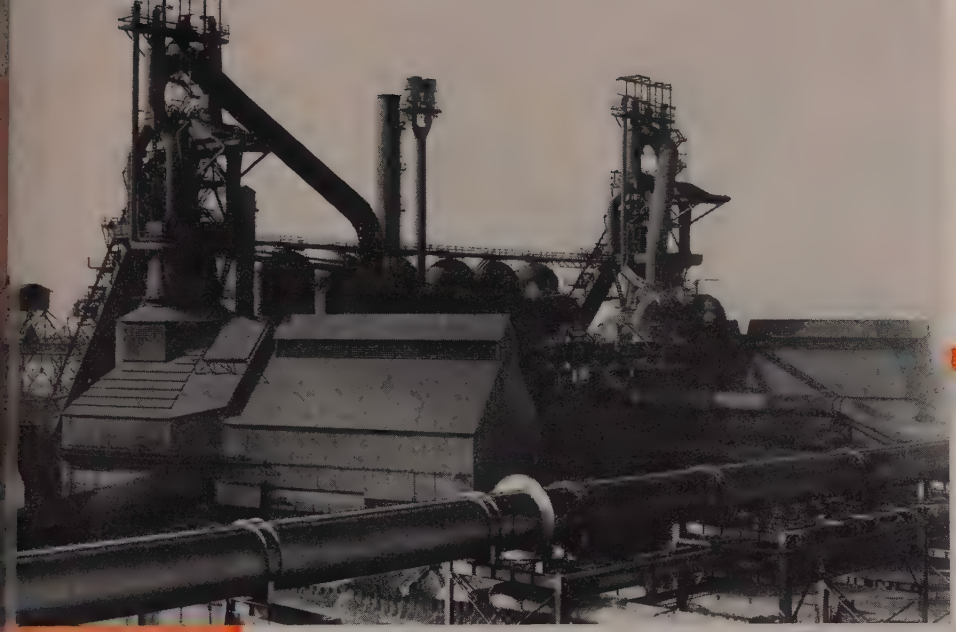
Resin is protected against excessive acid concentrations by a high conductivity cut-off on the acid percentage recorder and a differential pressure switch on the dilution water line which shuts down the concentrated acid system if conductivity gets too high or water flow rate drops.

Fast Rinse—After regeneration, the unit is given a fast rinse at the rate of 530 gpm. During this step, a high level probe in the acid reclaiming tank closes the valve to the tank and opens the valve to the neutralization system. When the lights on the panel indicate all cycles completed, and the operator

Fairless Works Blast Furnaces are third "twins" built by McKee for U. S. Steel



This view of the twin furnaces at Fairless Works shows the skip-bridge side with No. 2 Furnace in the foreground. No. 1 Furnace is almost hidden by the stoves, stack and conveyor belt from the coke ovens.



gle downcomer, eristic trade-mark ee design, shows on Fairless No. 1 at left. Clean gas the boiler house eground.

cleaning system between the two uses. Number 1 is on the left. A of Number 2's slag right foreground.

Arthur G. McKee & Company have designed and constructed nine blast furnaces for United States Steel Corporation since 1940. A tenth furnace is nearing completion in Cleveland. All ten are 26 to 28-foot hearth-diameter furnaces.

The two furnaces at Fairless Works comprise the third set of blast furnace "twins" designed and constructed for United States Steel by McKee. The project includes stoves, gas cleaning system, cast houses, stock house and related facilities.

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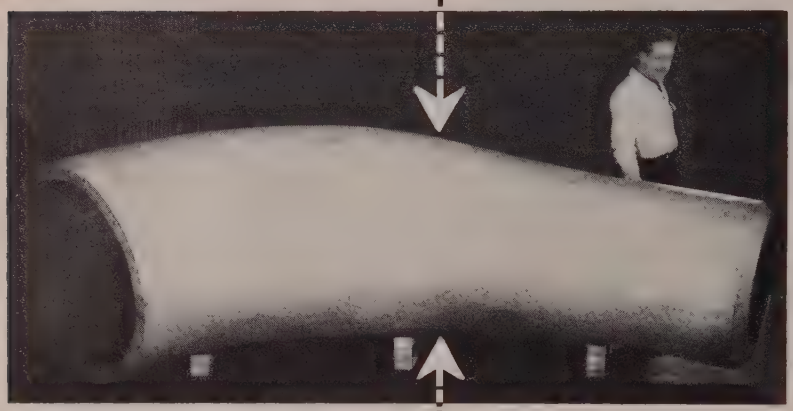
DURALOY

This Casting



Casting weight
21,000 pounds

Shipping weight
14,000 pounds

Alloying Elements
38% Ni., 18% Cr., 2% Mo.

Set a Record!

It's the weight rather than the Ni-Cr content that's the record.

We've cast many a piece with such a high Ni-Cr combination. But this represents the largest casting we have ever made. And it took careful scheduling of our entire battery of electric furnaces, with a double melt from two smaller furnaces.

Next followed a thorough X-ray for hidden flaws with our 400,000 volt unit. Then rough-finishing to specifications.

The significant fact is that this casting, the first of this size we have ever produced and destined for a most important high priority processing job, passed inspection with flying colors. *There was no reject here.* It is indicative of the skill of our metallurgists and foundrymen in turning out high alloy castings.

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has found the sodium leakage r
duced to a satisfactory point, l
can push the reset button and t
unit is automatically placed ba
in service, or allowed to stand
until needed.

When the reset button is d
pressed, the sludge blowdow
valve is automatically opened f
a timed period and then close
and the water fill valve on the r
claiming tank opened until t
high level probe is again covere
The regeneration cycle is the
completed until such time as t
operator again pushes the startin
button.

Anion Regeneration—Cycles f
regeneration of the anion unit
are as follows: Backwashing wit
cation effluent, regenerating wit
soda ash or caustic soda, a slo
rinse with cation effluent and tw
fast rinses. Spent regenerant s
lution, slow rinse, and the first
the fast rinses are discharged t
the neutralization system.

Two additional manual steps ar
required for the anion units. Whe
the regenerant dilution tank i
emptied, a low level probe light
a signal on the panelboard and th
operator must depress a button t
open the valve from the soda as
storage tank. When the highe
dilution tank probe closes thi
valve and lights an amber signa
the operator must again depres
the button to open the dilution wa
ter valve, which is then closed b
the highest level probe.

Tool Machines Axle Carriers

A special machine tool of it
Transfer-matic type for millin
drilling and tapping two-spee
truck axle carriers is announced b
Cross Co., Detroit. It has bee
delivered to the Axle Division
Eaton Mfg. Co., Cleveland.

With capacity for both spira
bevel and hypoid type carriers, th
new machine processes 53 part
per hour at 100 per cent efficiency

Features include a cleaning uni
for removing chips from fixture
between unloading and loading sta
tions, complete interchangeabilit
of all standard and special part
for easy maintenance, hydrauli
feed and rapid traverse, individua
lead screw feed for tapping an
automatic lubrication.

GIDDINGS & LEWIS — ALLEN-BRADLEY CONTROL PANEL

KEARNEY & TRECKER — ALLEN-BRADLEY CONTROL PANEL

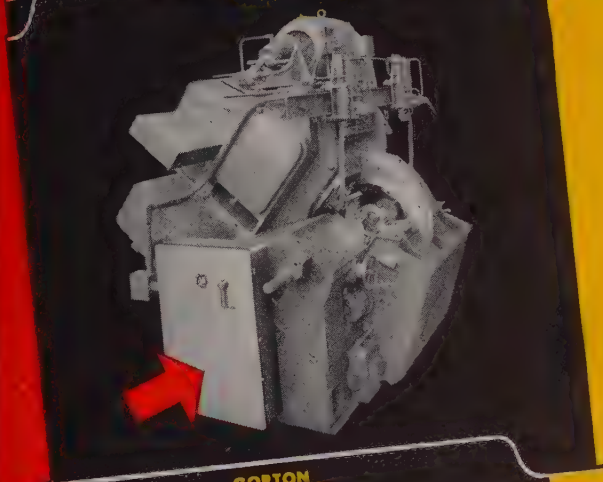
MICROMATIC HONE — ALLEN-BRADLEY CONTROL PANEL

LEES-BRADNER — ALLEN-BRADLEY CONTROL PANEL

FELLOWS — ALLEN-BRADLEY CONTROL PANEL

CROSS — ALLEN-BRADLEY CONTROL PANEL

LE BLOND — ALLEN-BRADLEY CONTROL PANEL



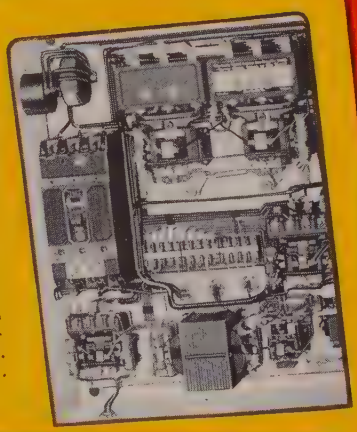
This LeBlond lathe has an Allen-Bradley control panel in cabinet at end of lathe. There are 20 components of which 14 are Allen-Bradley relays, contactors, and starters.

Allen-Bradley solenoid controls have ONLY ONE MOVING PART. No pins, pivots, or bearings to rust and stick. They are good for millions of trouble-free operations. That's why A-B controls are a sales asset to any machine tool.

GORTON — ALLEN-BRADLEY CONTROL PANEL

This Gorton milling machine has an Allen-Bradley sequence control panel in the machine frame with 6 A-B solenoid-operated relays and starters, all equipped with silver alloy contacts that require no maintenance.

The ITE circuit breaker is interlocked with the door handle, which must be in OFF position to open cabinet. This is an important safety feature. Specify Allen-Bradley... and be safe.



TROUBLE-FREE CONTROL PANELS

FOR ALL TYPES OF MACHINE TOOLS

Today . . . more and more machines are being "factory-equipped" with Allen-Bradley control panels. Why? Because Allen-Bradley solenoid relays and contactors are so simple . . . ONLY ONE MOVING PART . . . they assure maintenance-free service for years.

ENGINEERED TO FIT YOUR NEEDS

Machine tool panels, designed and built by Allen-Bradley, provide dependable, automatic sequence control of machining operations . . . with split-second accuracy. Allen-Bradley control panels are all tailor-made to get the greatest output from machine tools of every type. Your near-by Allen-Bradley sales engineer will gladly discuss your control requirements.

Send for Bulletin
ALLEN-BRADLEY CO.
1316 S. Second St., Milwaukee 4, Wis.

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ALLEN-BRADLEY

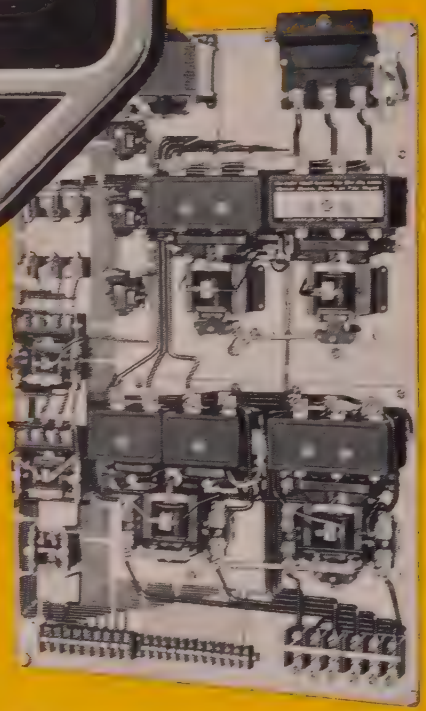
MOTOR CONTROL

A-B Quality

QUALITY COMPONENTS

FOR MACHINE TOOL CONTROL PANELS

A-B Quality



Bulletin 700 Universal A-C Relays

Bulletin 200 D-C Relays

Bulletin 713 Starter and Cir. Breaker

Bulletin 712 Starter and Disc. Switch

Bulletin 350 Drum Switch

Bulletin 600 Small Motor Starter

Bulletin 609 Manual Starter

Bulletin 709 Automatic Motor Starter

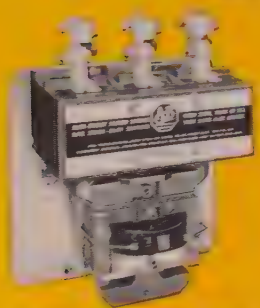
All components of Allen-Bradley control panels, like relays, contactors, starters, timers, fuse clips, or terminal strips, are long-established units in the A-B line. But while they have been field-tested in thousands of applications, they still are continuously tested during manufacture. That's how A-B control maintains its reputation for Quality. Specify Allen-Bradley.

Allen-Bradley Co., 1316 S. Second St.
Milwaukee 4, Wisconsin

Bulletin 849 Pneumatic Timer

Bulletin 802T Limit Switch

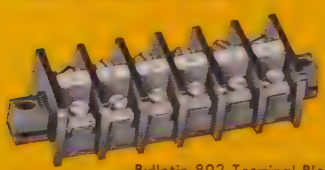
Bulletin 895 Auxiliary Contacts



Bulletin 702 Solenoid Contactor

Bulletin 800T Oiltight Push Buttons

Bulletin 891 Fuse Clips



Bulletin 892 Terminal Blocks

ALLEN-BRADLEY

TROUBLE-FREE MOTOR CONTROLS

3-54 B

melting Titanium

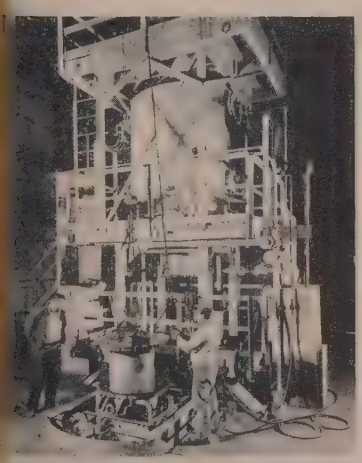
GIANT double-melt vacuum-e titanium furnace will, accord-to Titanium Metals Corp. of erica, completely remelt 4000-nd titanium ingots with im-ved metal homogeneity. It au-s purer metal at lower prices a more of it.

The procedure which allows the nace to do this is as follows: tead of relying on the usual cedure of flooding the furnace h slightly positive pressures of gon or argon-helium mixtures, permits removal of hydrogen m the titanium metal down to low as 0.005 per cent or 50 ts per million.

Demonstrated Advantages—The w procedure has demonstrated er advantages: More stable trical arcs, the ability to ac-mmodate greater power inputs d the production of smooth in-s requiring little or no condi-ning prior to continuous mill con-sion into sheet and strip for litary air frames or direct fab-ation into bars and billets for engines.

The company initiated the con-mable-arc technique to large le mill production about three ars ago. Using the technique, tal to be melted becomes the ctrode of its own arc furnace.

Another Plus—Along with the uble-melt technique, the vacuum lting process and accumulating ow-how in the art of conversion o mill products will help to in-re an increasing supply of quali-metal.



GIANT TITANIUM FURNACE
. . . remelts 4000-pound ingots

. . . they call us
"the house of structurals"

We constantly get calls for extra large sizes in beams or channels . . . structurals that mills roll only two or three times a year can usually be found in Levinson stocks. Chances are we can take care of your inquiries, too. Since we always carry standard sizes in beams, angles, channels, plates, rounds, etc., you can buy to advantage in the larger weight brackets.

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Central Ohio Warehouse
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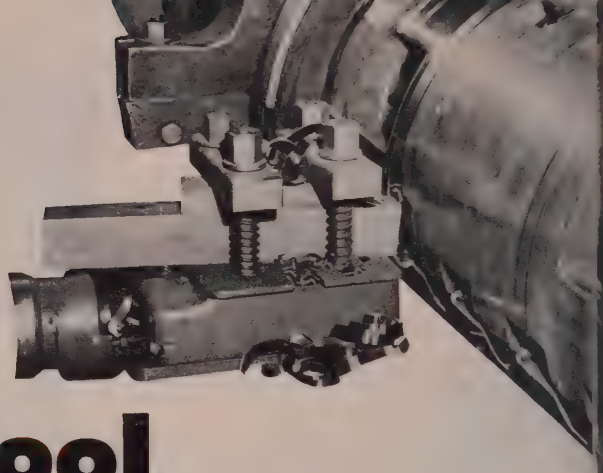
STEEL WAREHOUSE SERVICE

Pick the RIGHT Carbide Tool



Cutter selection must be equated to the job requirement Tool type, shape and carbide grade are all variables. Grad choice can be based on wear characteristics

By BENNETT BURGOON JR.
Kennametal Inc.
Latrobe, Pa.

PROPER ANALYSIS of tool requirements is the starting point for success in machining. This applies to single-point carbide cutting just as surely as to any other machining operation.

The analysis can be considered as involving three basic steps: Proper tool selection, correct tool grinding, and the tool application to the job. Simply, get the right tool, see that it's properly ground and keep job conditions right for maximum tool performance.

Choice—Three basic types of carbide tools can be used in single-point cutting. They are: Standard brazed tools, clamped-insert type, and the indexable insert tools.

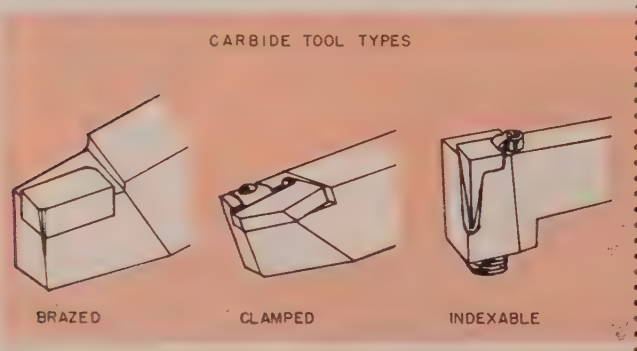
Brazed tools are low in initial cost, usually available from stock, and are suitable for most general-purpose machining operations.

No Strain—Horizontal clamped-insert tools, while higher in initial cost, have the advantage of being strain-free. The tip is well supported by a hardened shank and it's suitable for heavy-duty machining operations.

Vertical insert tools with square, round, or triangular cross-section inserts, have the advantage of being indexable. Higher initial cost is more than compensated for by increased productic on the machining of high produ tion parts.

Indexing the inserts reduc downtime for tool changes. Tip are strain-free, rugged and sui able for long-run jobs. They a designed for normal machinir operations rather than for heav stock removal and are usually co sidered for production runs whe the depth of cut does not exce ¼ to ⅜-inch.

Shape—Having determined th type tool to be used on the jo next step is to decide on tool sty and shank size. All three bas types of tools are available in



WEAR CHARACTERISTICS
EXCESSIVE EDGE WEAR
This condition can be caused by:
(1) Running the work at too high speed
(2) Cutting with too light feed.
(3) Using a carbide having insufficient abrasion resistance
EXCESSIVE TOP SURFACE WEAR
This condition can be caused by:
(1) Running the work at too low speed
(2) Cutting with too heavy feed
(3) Using a carbide having insufficient cratering resistance
Maximum tool life is realized when neither edge wear nor top surface wear is excessive

CRATER & EDGE-WEAR RESISTANT

	MATERIAL TO BE CUT	TYPE CUT
ard	Steel of Usual Ranges[1]	Finish Cuts
neral Purpose	Steel of Usual Ranges[1]	Heavy Roughing on Cast Steel
	Steel of Usual Ranges[1]	Medium Cuts
	High Manganese Steel	General Use
	Cast or Rolled Armor Steel	General Use
	Inconel	General Use
	Inconel X	General Use
	Nimonic Alloys	General Use

CRATER-RESISTANT*

	MATERIAL TO BE CUT	TYPE CUT
ard	Steel of Usual Ranges[1]	Fine Finishing
eneral Purpose	Steel of Usual Ranges[1]	Medium Cuts
	Steel of Usual Ranges[1]	Finish Cuts
	HSS (Annealed)	General Use
	Monel Metal (K,S)	General Use
rong	Steel of Usual Ranges[1]	Heavy Roughing on Forged or Rolled Steel

(carbon, nickel, nickel-chrome, molybdenum, chromium, chrome-vanadium, SAE 52100, martensitic and ferritic stainless)
High in crater resisting constituents such as $WTiC_2$

EDGE-WEAR RESISTANT

	MATERIAL TO BE CUT	TYPE CUT
Hard	Stainless Steel 18-8, and Series 300 (Austenitic)	Fine Finishing and Precision Boring
	Cast Iron	Precision Finishing
	Titanium Alloys .7% Carbon	Finishing
	Titanium Alloys .2% Carbon	Finishing
	Discaloy 24 or Timken 16-25-6	Contour Finishing
	Non-Metallics	General Use
General Purpose	Stainless Steel 18-8, and Series 300 (Austenitic)	General Use
	Cast Iron	General Use
	Chilled Cast Iron	General Use
	Ni-Hard	General Use
	Malleable Iron	General Use
	Copper Alloy Iron	General Use
	Brass	General Use
	Aluminum Bronze	General Use
	Aluminum and Magnesium Alloys	General Use
	Titanium Alloys .7% Carbon	General Use
	Titanium Alloys .2% Carbon	General Use
	Discaloy 24 or Timken 16-25-6	Contour Finishing
	Non-Metallics	Heavy Roughing
Strong	Stainless Steel 18-8, and Series 300 (Austenitic)	Heavy Roughing
	Cast Iron	Heavy Roughing
	Discaloy 24 or Timken 16-25-6	Roughing

ety of styles for specific ma-ing jobs.

or efficient machining, it is es-tial to use a tool of adequate . While the sturdier, larger l costs a little more, it is eco-nical in the long run.

Material—Next step is to spec-the correct carbide grade for job. Grade specification is t approached, we feel, through wear characteristics. Thus ssified, carbides can be grouped three categories: Those which ist edge wear, those which re-top wear or cratering, and se which fall in the middle and e a combination of the first characteristics. The last up is used for general purpose chining.

Subdivision—In each of these e groups there is a hard grade h maximum wear resistance, a dium grade for average condi-ns and a strong grade for se-e machining operations where der grades might chip. What-er make of carbide is used, it uld first be determined where the grade fits into the picture in relation to its wear characteristics and its hardness.

Since an edge-wear resistant and a crater resistant carbide may have the same hardness, hardness alone is no measure by which to select the grade for a specific job.

Strength and thermal properties are closely associated with wear characteristics. In general, crater-resistant grades have lower thermal conductivity than wear-resistant grades. They are also lighter in weight. They have a lower modulus of elasticity when comparing grades of equal hardness or equal strength measured by the transverse rupture test.

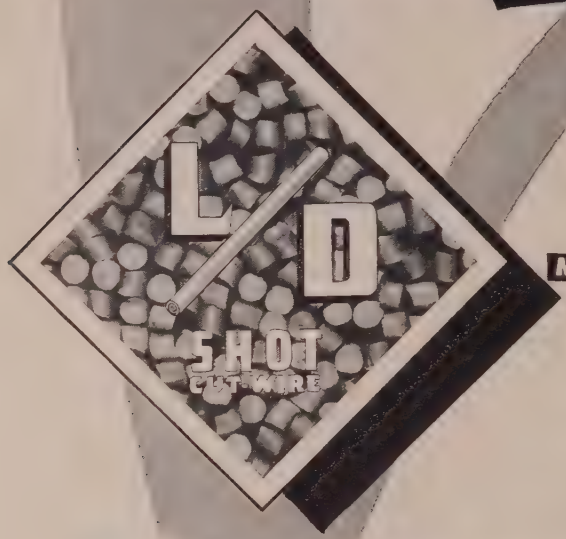
Grinding — Second step to efficient machining is to make certain that correct tool grinding practices are used, so that when the proper tool is put on the job it will be correctly reground. (Note: See STEEL, April 26, p. 98) Improper grinding of tools has always been the main cause of poor tool performance and tool failures.

Fifty-Fifty — Assuming proper type, style and size of tool have been selected, and that grinding practices are right and conditions on the machine (rigidity of machine, condition of workpiece, tool blocks, etc.) are the best possible under the circumstances, the question still arises, "Are we getting maximum tool performance under these conditions?" To answer this question, we must analyze tool wear.

Balanced tool wear in machining steel and other high tensile materials means that wear on the edge and on the top (crater) should develop at a uniform rate. Neither wear should be excessive in relation to the other. Three important factors must be considered in relation to tool wear. These are: Proper speed, correct feed for that speed, and best grade of carbide for the job.

Partners—Speed can be determined from tables supplied by the carbide manufacturer. Ratio of speed to feed is important; they go hand in hand. Lighter feeds

CHECK THESE BIG VALUES! 4



For use in:

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CLEANING
PEENING
TUMBLING
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ABRADING

Harrison L/D Cut-Wire Shot provides these four outstanding advantages:

✓	**LONG LIFE**	Lasts many times longer than any cast shot. Stands up against thousands of impacts.
✓	**UNIFORM SIZE**	Cut to specific sizes. Each particle size provides same impact and same finish.
✓	**UNIFORM HARDNESS**	Variable hardness of malleable iron or steel shot is avoided—each piece is the same.
✓	**LOWER COSTS**	You save on total abrasive cost, labor, maintenance, machine time, handling and storage.

Send for

TECHNICAL BULLETIN No. 7
"Cut Wire Shot —Its Development and Use"

Available in Steel, Copper and Stainless, in a range of wire diameters and other properties. Can also be produced from any desired type of wire with sizes varied as to relation of length to diameter.

HARRISON ABRASIVE DIVISION
METALS DISINTEGRATING COMPANY, INC.
Elizabeth B, New Jersey

Also producers of HARRISON CHILLED SHOT—HARRISON DIAMOND GRIT

SUBSIDIARY OF AMERICAN-MARIETTA COMPANY

are used at higher speeds wi heavy feeds are taken at lo speeds.

Grade Switch — If exces crater or edge wear still pers after speeds and feeds checked, it may be due to impr er grade selection. Knowing wear conditions and the grade carbide being used, you change the grade on the basis known wear characteristics.

For example, if a medium-h crater-resistant grade such K3H is being used and the shows excessive edge wear, be performance could probably obtained from a medium-h grade in the intermediate (gen purpose) group such as K4H. the other hand, if the tool sho excessive cratering, it would m going to a harder grade in same group, in this case K5H.

If, after doing this, the t chips on the cutting edge, it wo probably mean continuing to the medium crater-resistant gr as the grade best suited for t particular cut.

From a paper presented at University Wisconsin for On Campus Conference spons by the local ASTE chapter.

Machine Works Diffuser Cases

A machine combining speed, p cision and automation in the pr essing of aircraft diffuser cases announced by Snyder Tool & En neering Co., Detroit.

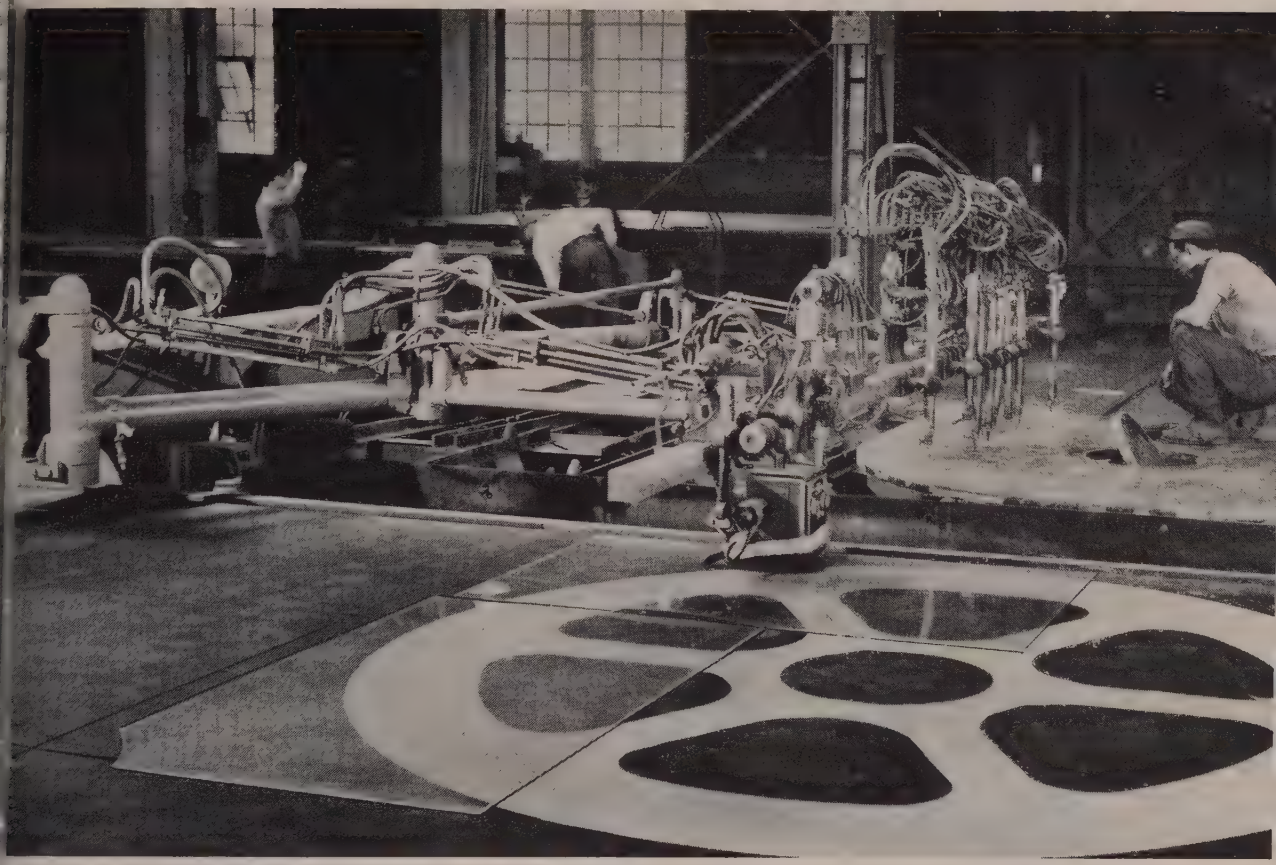
Workpiece is a hollow, truncat stainless steel cone approximat 17 inches high in the center and inches in diameter at the large mension. Around the outer clined wall are located a numb of irregularly-spaced bosses wh are to be machined. Machine c sists of a fabricated steel base which is mounted an index ta with three special boring and f ing units mounted on colum around it.

Two of these units mount hea which are tooled to bore throu a boss, then feed radially to fa off the same boss. The third u positions the head and causes r dial feed of tool to face only. T slow feed rates necessitated by s gle point tooling are accurate controlled by the use of 12-inc diameter cylinders from which h draulic fluid is accurately meter

CONTINENTAL

STEEL FABRICATIONS AND WELDMENTS

Components or Assemblies



ustom or Production?–Save time and Money!

Here's one reason why Continental-made weldments can save you time and money. This multi-head flame cutter, guided by an electric eye, can cut up to eight shapes at once—from any metal that can be burned with oxygen or oxygen and powder. Working from paper templates, it saves pattern costs.

For welded components or complete assemblies—one of a kind, or quantity production—Continental's modern equipment and methods offer you design flexibility and production economy.

WRITE

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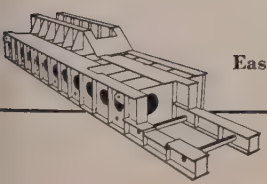

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CONTINENTAL
Foundry & Machine Company

Refining Light Metals

Cost of beryllium and other refractory ores may come down as a result of this arc process

INVENTORS of a new arc process for refining light metals believe that the method can reduce production costs of such metals as beryllium as much as 75 per cent. At present beryllium costs about $100 a pound in ingot form.

Expensive and difficult to treat by conventional methods because of its high melting point and other properties, it has been used chiefly to increase the strength, machinability and toughness of other metals.

With the prohibitive cost reduced, the inventors expect the metal to find wide applications in atomic energy as a moderator to promote the slow, steady fission needed for generation of commercial electric power.

Arc Process Explained — Dr. Charles Sheer and Dr. Samuel Korman, both of Light Metals ... fining Corp., explain their new ... cedure in this manner: Raw or ... crushed into rod-shaped electr... containing about 30 per cent ... coal. The rods are first bake... render them electrically cond... ing, then are consumed continu... ly in an arc furnace by high ... tensity arc struck between op... ing ends of two such rods.

Major advantages of the proc... say the inventors, are derived f... the unique characteristics of ... high intensity arc. This type ... arc, used in large military sear... lights, but never before in a ch... ical process, causes the materia... the rods to vaporize rapidly fr... the ends.

Hotter 'en Sun—They go on ... say that the temperature achie... is 15,000 to 20,000° F. The ...

TYPICAL LAB SETUP
. . . feed and brick arc chamber

material is broken down to its e... ments and ejected into the atm... phere of the furnace, where the e... ments are combined with chlori... and subsequently reclaimed as m... als by electrolysis.

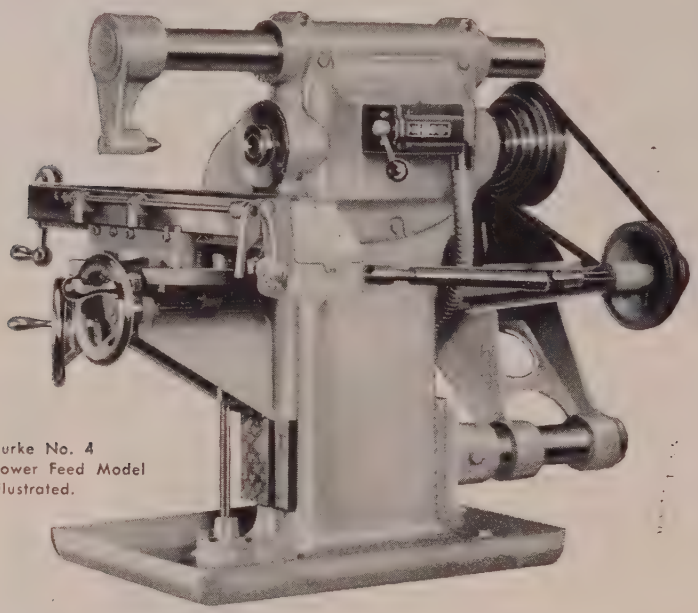
Though Light Metals Corp. w... confine itself to the refining ... beryllium for its initial efforts, t... Sheer - Korman patented proce... may be adapted to the refining ... other metals including aluminu... magnesium and lithium. Th... plan a prototype plant with a c... pacity of 10,000 pounds of bery... lium a year to test the commerci... feasibility of process.

Dr. Sheer has been research a... sociate in nuclear physics at C... lumbia University since 1947.

IT'S AMAZING

what these little rascals can do!

That's why Burke Bench Millers are a big favorite in thousands of tool, school, development, repair and mass production shops.



Burke No. 4
Power Feed Model
Illustrated.

BURKE Bench Millers

— are so rugged, accurate and versatile they can practically reproduce themselves!

Send for complete data on models, specifications and full line of attachments.

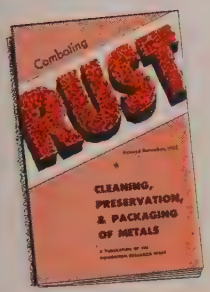
THE U. S. BURKE MACHINE TOOL DIV.

Brotherton Road 14, Cincinnati 27, Ohio

HARMLESS?

Just a few harmless looking drops of water—so long as they don't come in contact with unprotected ferrous metals! But when they do—either as drops, vapor, steam or just plain humidity—they can cause costly damage. It's a simple matter, however, to ward off this danger and protect your products from rust with Houghton Rust Veto!

First in the field of rust preventives—Houghton is still first. Behind every Rust Veto for every rust prevention job there's long and intensive experience and research that makes each one right for the job you want done. From corrosion protection for highly finished precision parts to rust prevention for machinery, dies and pre-fabricated metal there's a Rust Veto designed expressly for the application. To find out about them and their place in your plant or process, call the Houghton Man. Or write direct to E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.



HERE'S A STORY

that can save you time, trouble, money. Send for your copy of this complete 72-page manual on rust prevention.

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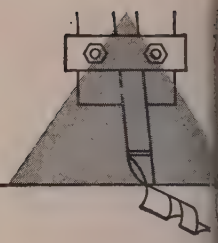
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

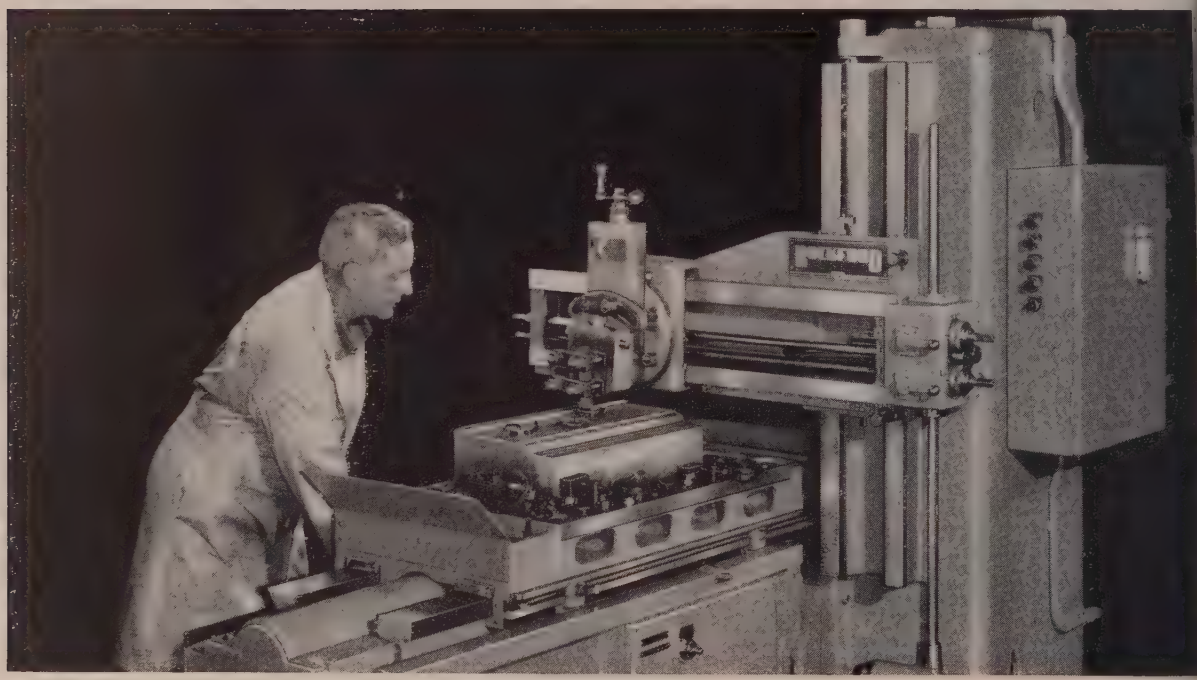
Ready to give you on-the-job service . . .



how much does an openside shaper cost?

rockford hydraulic-driven 36″ openside

shaper



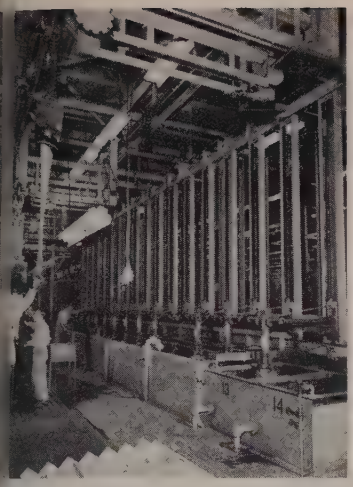
you may be **surprised to know** . . . . . that you can buy the 36″ Openside Shaper for little more than the cost of a ram-type shaper. Yet the 36″ openside offers the advantages of planer accuracy and easy set-up, in addition to production flexibility. The standard machine complete with electrical equipment can be bought for as little as $9,035.00. Side head, hydraulic tool lift and other accessories are extra at popular prices. Similar machines are also built in 48″, 60″ and 72″ table lengths and priced accordingly. Consult your Rockford Machine Tool Co. representative for full details or write direct.

Get this handy time calculator for use in estimating machining time for shaping and planing operations. Request on company letterhead will bring one promptly.

OUR 52nd YEAR

ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET · ROCKFORD, ILLINOIS



tomatic Plating Transfer

omatic transfer of steel propeller des by this Hanson-Van Winkle- ning elevator-type plating convey- peeds zinc plating at United Air- t Corp., Windsor Locks, Conn. The allation gets the job done 30 to 50 cent faster than a former manual dling system. Unusual feature: omatic transfer of blades from and k to plating conveyor. Lift is 10½ ft

ating Tin Plate

FFERENTIALLY-COATED tin te is one of the new products ng produced at the Aliquippa rks, Jones & Laughlin Steel rp.

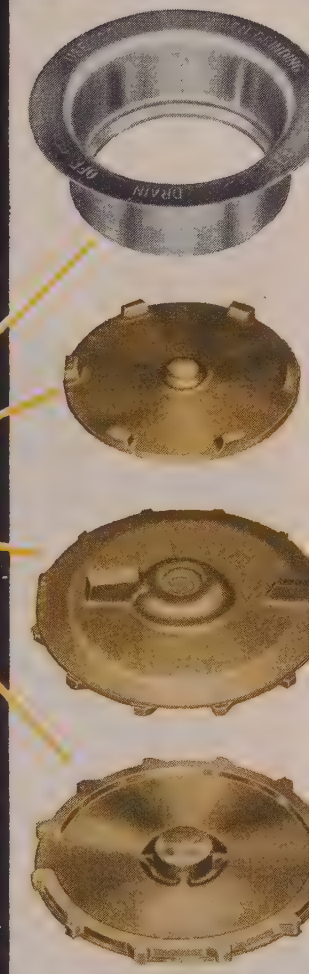
The new plate provides a can terial with enough tin to give tection against certain corrosive ds on the inside of the can, with excess of tin on the outside. In s for these foods, the new tin te can replace hot-dipped tin te with a single weight of tin tributed over both sides of the .

Can Coat—One side of differen- l-coat tin plate carries a tin ting weight equal to one pound base box. The other side has equivalent of 0.25 pound of tin base box. Coating on both es of the plate averages about millionths of an inch. Hot- ped tin plate for the foods car- s the equivalent of 1.25 pounds base box.

Management reports that the v dual coat saves up to 45 per t on tin. And, since it is not quered inside for metal can age, it opens a new field for elec- lytic tin plate.

contribute to the efficiency of this modern waste disposal unit

***MUELLER BRASS CO.** facilities include: designing, die-making, forging, tooling, machining, polishing, plating and assembly



Three Mueller Brass Co. forgings play an important part in the fine operating performance of this modern waste disposal unit made by the Eureka-Williams Co., Division of the Henney Motor Co., Inc. This unit does a speedy and thoroughly effective job of pulverizing garbage and has made life easier for American housewives. The impeller disposer that chops up the waste food in the disposal unit, the disposer cover and the sink mounting flange are all forged by the Mueller Brass Co. This is another outstanding instance where Mueller Brass Co. forgings have improved product performance and cut costs. High quality forgings can be produced from standard and special brass, bronze and aluminum alloys. And in addition, the Mueller Brass Co. offers complete service ranging from product design to finished part . . . Write today for complete information and new 32 page forgings handbook.

1. Sink mounting flange, forged, machined, nickel and chrome plated by Mueller Brass Co.
2. Machined and finished disposer cover forging.
3. Cutting side of impeller disposer forged from 600 series bearing bronze.
4. Reverse side of impeller disposer.

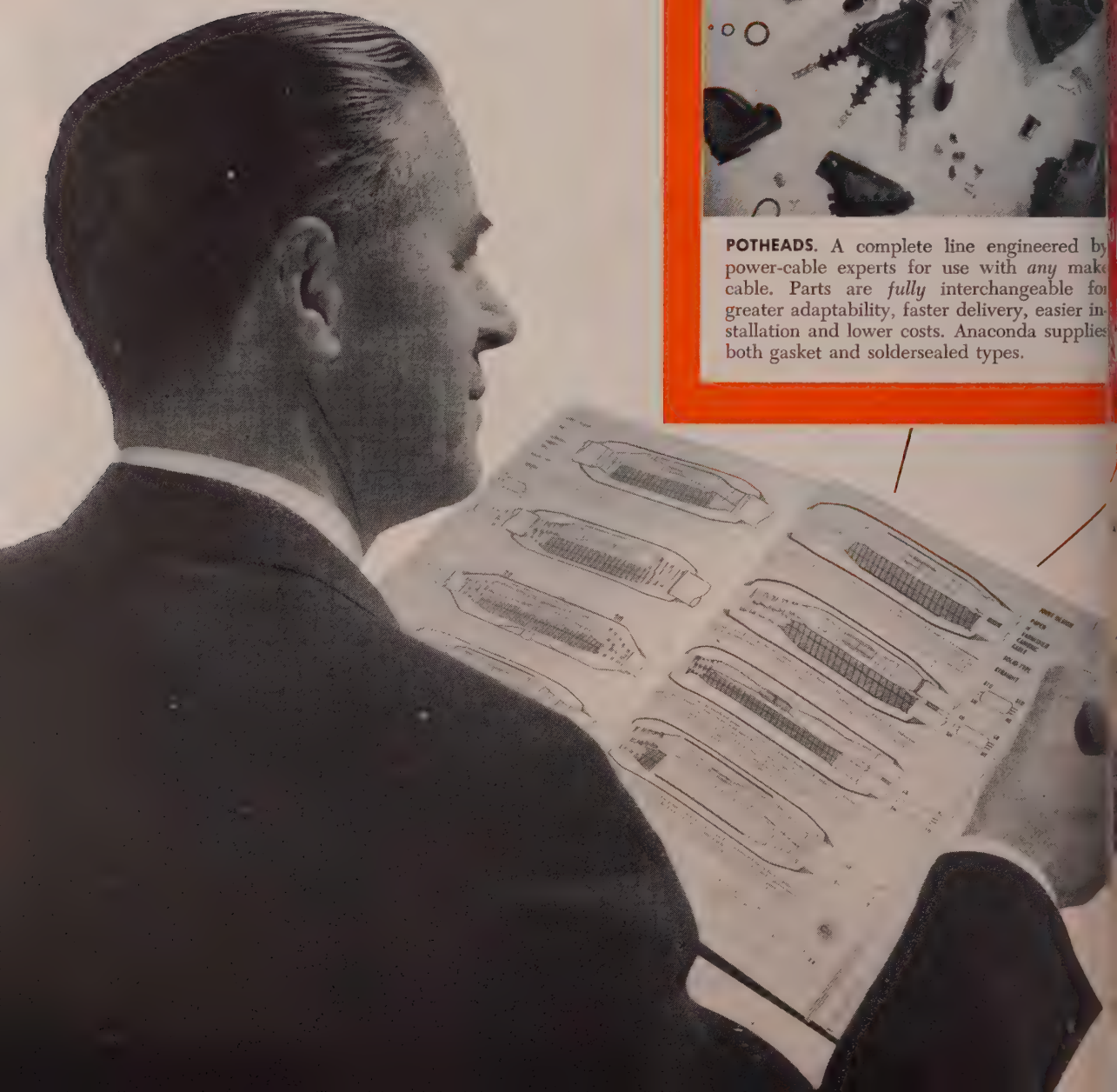
MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

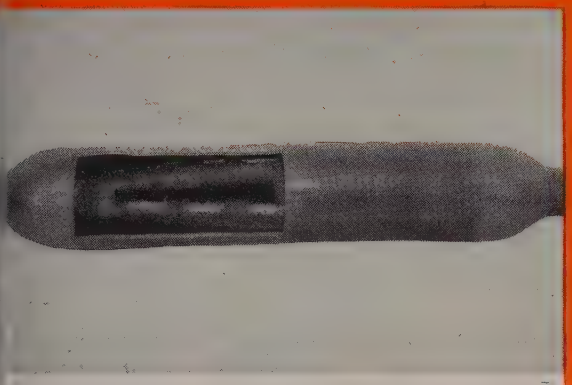
This New Anaconda Catalog Puts

The right cable accesso

POTHEADS. A complete line engineered by power-cable experts for use with *any* make cable. Parts are *fully* interchangeable for greater adaptability, faster delivery, easier installation and lower costs. Anaconda supplies both gasket and soldersealed types.



..at your finger tips



F-3* ALLOY-LEAD JOINT SLEEVE. F-3 has higher tensile strength, lower creep rate, greater bursting strength, and higher resistance to bending fatigue and vibration. Furnished with jointing kit when specified.

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FILLING COMPOUNDS. A group of compounds both plastic and fluid to meet every need: for paper-, varnished-cambric and rubber insulated cable joints and potheads for voltages up to and including 69kv.

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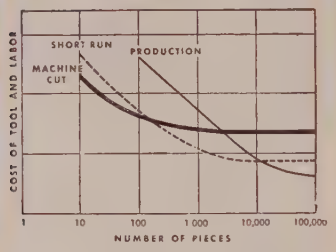
Our impartial use of three basic methods gives you economy regardless of length of run.

Most parts can be made by all three methods. But only **one** is **most** economical. The right decision is a technical one, based on **over-all** quantity, contour dimensions, tolerances and materials.

YOUR SUPPLIER SHOULD KNOW ALL THREE METHODS



This logarithmic chart shows the effect of these factors on the **specific part** illustrated. From 1 to 150 parts, our own **Machine-Cut Method** with no die cost whatsoever is most economical. At 150 parts, the **Short-Run Method** using economical blanking dies and stock punches is best. At 10,000 units, the standard **Production Method** with standard dies is most satisfactory.

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STAMPINGS DIVISION

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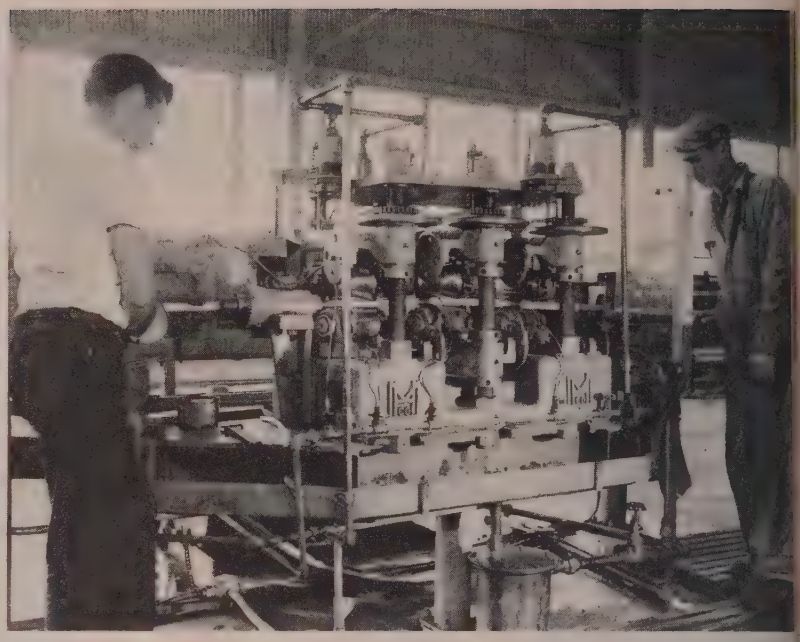
3406 Jnion Street, Glenbrook, Conn.



Straightener Straightens To Specs In One Pass

One pass through the model AX rotary straightener made by Mackintosh-Hemphill is normally all that is needed to meet customer specifications. Revere Copper & Brass Inc. seamless drawn aluminum tubing in 60-foot maximum lengths, with diameters extending from ¼ to 1¼ inch, has no more than 0.010 inch per foot deviation after straightening. Two men perform operation. About 1-1/3 miles of tube with 0.028 to 0.148-inch wall is straightened per hour.

Automatic Tongs Position Convection Spacers

SPECIAL spacer tongs are saving considerable time and adding to the safety of operations in the annealing department of the tin mill at Weirton Steel Co., division of National Steel Corp.

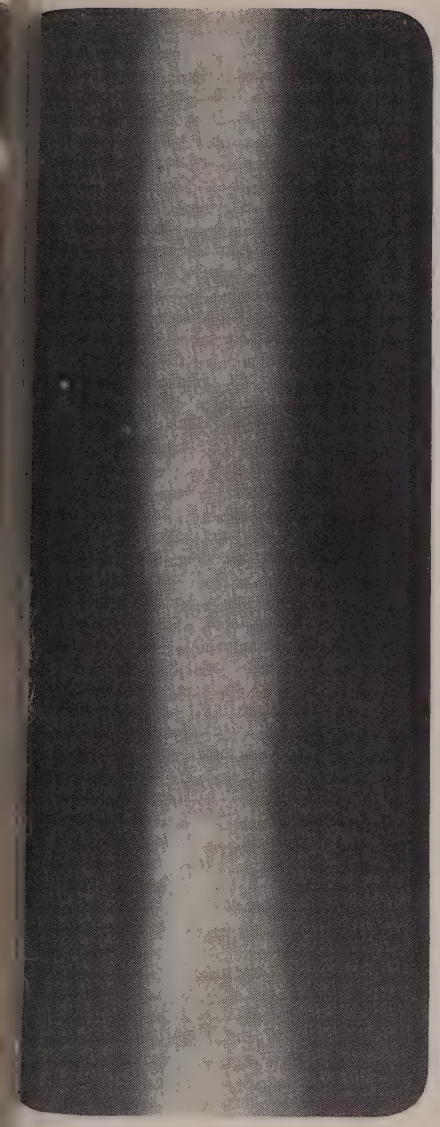
Used in lifting and positioning convection spacers, the tongs are themselves picked up automatically by coil tongs suspended from an overhead crane. Thus the crane can shift quickly from lifting coils to lifting the spacers. Normally four annealing furnaces are loaded at a time, using the tongs to lift and position the coils.

Tong Construction — Manufactured by Heppenstall Co., Pittsburgh, the spacer tongs consist of a three-legged mandrel with a centering guide that can readily be lowered into the inner diameter of a convection space, or a pile of spacers. A ratchet device, controlled with a three-position lever, permits three different operations: Tongs will deposit spacers on coils one at a time; they will pick up spacers one at a time to the full capacity of 12 spacers; tongs will discharge an entire load of spacers.

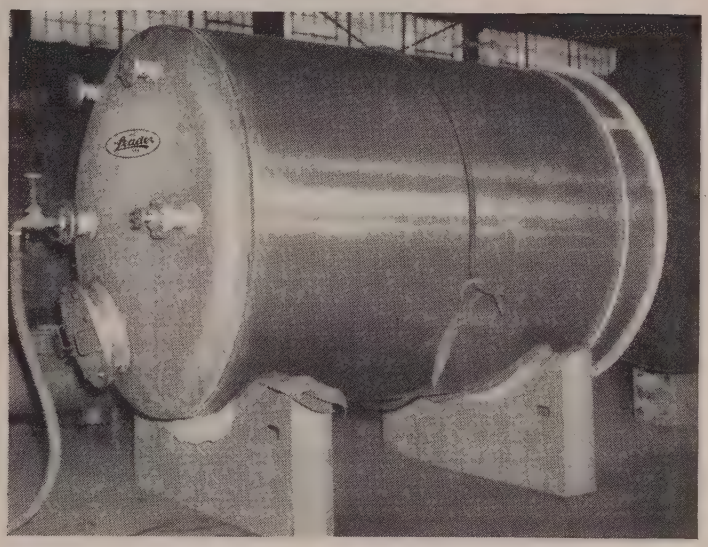
To add to the convenience of operation, the mandrel is attached to a steel falsework of approximately the same shape and diameter as a coil. This permits the spacer tongs to be picked up quickly by the coil tongs, and discharged as quickly.

Spacers Automatic—The spacer tongs are automatic in operation, except for the need to set the position lever for operation desired. Once they have picked up a spacer, tongs will not let go until it is safely positioned on a coil or delivered to the storage rack.

Coil tongs are entirely automatic, their operation controlled by the craneman from his cab. Workmen on the floor of the annealing department serve as signalmen to guide the crane operator in positioning the coils and spacers.



RADIOGRAPHY makes positive



about negative pressure

Specifications for this tank—designed to operate from vacuum to 25 pounds' pressure—called for welded 2S aluminum. This, as welders know, could cause problems. But the builders called on radiography. Here is what they say:

"X-rays played a very important part in the extensive research to determine the most suitable method of welding the vessel. Without the use of x-ray we might never have obtained the high quality and uniform results."

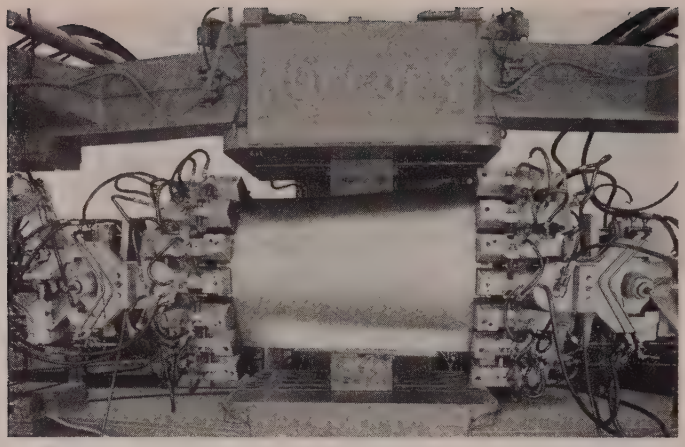
Which shows two important facts. First, that radiography proves the soundness of welds. Second, that it expands the use of the welding process.

This is good reason that today more and more welders make use of radiography. If you would like to know how it can help your business, get in touch with your x-ray dealer and talk it over.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography . . .
another important example of Photography at Work

Kodak
TRADE-MARK



Once proper elongations and radii are established, titanium is adaptable to stretch forming—here A-70

How to Form Titanium

Here is another spot where titanium is expected to gain an early foothold commercially. Metal resists sudden movement, but good results are obtained by working slowly

By C. I. BRADFORD
Vice President and Director of Operations
Rem-Cru Titanium Inc.
Midland, Pa.

WITH the aid of a few basic rules and proper equipment, titanium sheet can be formed on a commercial production basis. Many operations can be carried out at room temperature.

Since the metal resists sudden movement, best results are obtained by slow working. Use stretching, hydropressing and draw pressing in preference to punch pressing and drop hammer work. After severe cold forming, stress relieving is desirable.

Some parts can be formed at room temperature, but others are more readily produced warm. If difficulty is encountered with cold-forming, warming dies and/or work usually will overcome the trouble. Minimum heating helps, but better results are obtained in the 500 to 800° F range. (Surface discoloration can be removed by grit blasting or by a brief dip in a solution of 10 per cent nitric —2 per cent hydrofluoric acid in water at about 130° F.)

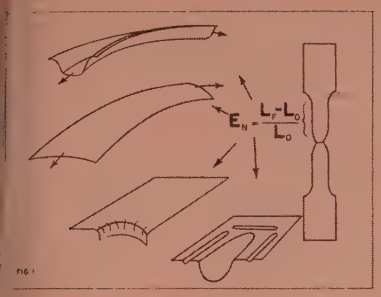
Methods—Of course, the lower-strength, commercially-pure grades, such as A-55, have more ductility and ability to take a sharper bend than the alloys. However, C-110M will take a bend as sharp as A-70. This brings up the question of predictability.

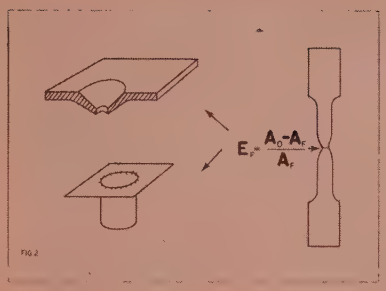
Expectations of performance can be estimated to a fair degree from laboratory tensile and bend tests. In operations such as wrap forming, skin stretching, stretch flanging, bend and restrained press forming (where plastic deformation is general over sizeable areas), the limiting elongation possible before part failure generally correlates with uniform elongation (see Fig. 1).

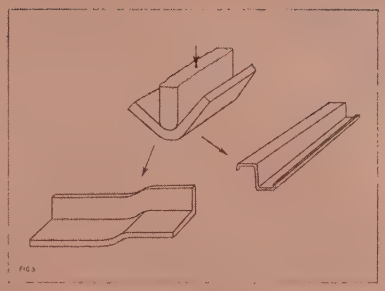
Where plastic deformation is highly localized, as in drawing, dimpling and severe bending, zero gage length elongation correlates closely with actual performance—value can be calculated directly from the reduction in area figure (see Fig. 2).

In bending, strain distribution is somewhat different from that of the tensile specimen. The outer fiber is stretched in one direction, while severely constrained along the bend axis and supported by a strain gradient in the thickness direction. Zero gage length elongation correlates well with bendability only in fairly sharp bends with thin material (see Fig. 3).

Bending, Brake Forming—At room temperature, A-55 can be bent around a radius equal to twice its thickness or a diameter of 4T. With A-70 and C-110M, safe practice suggests a radius of 3T or diameter of 6T. Warming







sheets and brake dies to 500 to 800° F allows sharper bends and the danger of breakage is lessened, especially with C-110M.

In cold or warm bending, slow speeds are desirable. Pressures should be greater than those needed for low carbon steel. Conditions like those for half-hard stainless have proved successful. Channel width of 4R + 2T (R = punch radius; T = sheet thickness) is normal.

Stretch Forming—Consistently satisfactory parts are made by this method, once proper elongations and radii are established. Work is normally at room temperature.

Areas of localized stress concentrations should be avoided to prevent failure due to necking. Jaws or grips can be covered with emery paper to prevent breakage at those points. Slow stretching and holding at full load provides increased uniformity because of the unique creep properties of the metal.

Titanium is particularly suited to make double curved parts, curved angles and channels, which are first bent on a power brake.

Hydropress—While this method can be used in stages at room temperature (with intermediate anneals at 1100° F), it gives best results with heated steel form blocks and parts.

Unit pressures of 1400 to 8700 psi have been used but higher pressures are preferable. Heat-resistant rubber pads, with asbestos protection sheets, are recommended. Press forming at about 800° F, followed by hand forming at 400 to 500° F, where needed, gives superior results. Properly controlled torch heating is suitable.

Springback charts will help reduce hand working, particularly when forming temperatures can be controlled accurately.

Drop Hammers—As in other forming methods, some parts can be worked at room temperature. Multi-stage operation (with intermediate, stress-relief anneals) has been successful.

For production forming on the drop hammer, however, parts and dies should be heated. Best results have been obtained with steel dies or hard-faced Kirksite, with hardened steel inserts.

Heat-resistant rubber is required. The dies can be maintained at about 300 to 400° F, with the titanium heated to about 800° F. Techniques similar to those employed for stainless are suitable.

Wrinkles can be removed by subsequent, warm hand work. Galling can be troublesome if considerable metal flow across the die face is required, although proper lubrication tends to eliminate this condition.

Punch Press — Blanking and piercing operations have offered no problems. Die angles and clearances used for annealed stainless have been satisfactory and good results have been obtained.

Drawing and forming require slow press speeds, allowance for springback, heated dies and adequate lubrication. Molybdenum disulfide and phosphate coatings are preferred to petroleum-base lubricants.

Spinning—Method can be used at room temperatures but is much more successful with warm sheets and dies.

Many titanium parts have been spun with good results when the temperature of the work and tools is maintained at about 500 to 800° F.

Dimpling—Another operation that is best performed warm: A-55 and A-70 can be dimpled at room temperature but cracking is less likely at about 700° F. This is particularly so with C-110M.

Last Word on Heat—Question of using it is important. Many aircraft plants have gained considerable experience in warm forming in the production of magnesium alloy sheet parts. They think that real advantages accrue by heating titanium sheet in the 500 to 800° F range for such operations as brake forming, drop hammer forming, reverse bending and, particularly, spinning and deep drawing.

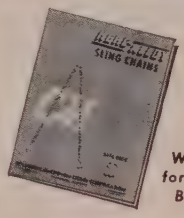
Advantages are that power requirements are lowered and scrap is reduced by allowing more severe forming before problems of cracking and wrinkling become serious. Springback is reduced and tighter bend radii can be obtained.

This concludes a series of five articles on titanium by Mr. Bradford. First four discussed: May 10, Properties and Availability; May 17, Grinding; May 24, Hot Working; May 31, Heat Treating and Metallography.

SPECIFY

HERC-ALLOY

SLING CHAINS



Write for Data Book

HERC-ALLOY Sling Chains are made-up to order, are individually tested, registered and guaranteed.

Hundreds of plants like the one shown above* are using Herc-Alloy Sling Chains. Greater safety is their big reason for doing it. But there are other factors too. Herc-Alloy is economical because of its long service life. Then too, the use of alloy steel permits a weight reduction that helps prevent worker fatigue. These advantages are worth thinking about. Those who do consider them seriously generally adopt safe Herc-Alloy Sling Chains for their plants.

*LAKE ERIE ENGINEERING CORPORATION — MANUFACTURER OF HYDRAULIC PRESSES

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Grinding 302 Stainless

Used primarily for polishing, these machines adapt to grinding to uniform 0.0365 inch

ADAPTABILITY of machines to special jobs, for which they were not designed, can show the way to profitable production. A good example is some work turned out by Stainless Machine Polishing Co., Oakland, Calif., for a San Francisco electric firm.

The latter required a quantity of type 302 stainless sheet with uniform thickness of 0.0365 inch $\pm$0.0005 inch, polished to a No. 4 finish on both sides. Permissible mill tolerances for sheet of this thickness is $\pm$0.004 inch.

Corrective Grinding — The Hill Acme sheet grinding and polishing machines operated by Stainless Machine Polishing Co. employ wide abrasive belts vertically mounted. Metal sheets to be ground are clamped to a reciprocating table similar to a planer. As work passes under the belt, a steel pressure roll presses the work against the belt causing grinding action across the sheet width.

These machines are used in the main to polish stainless steel sheets and are not classed as precision grinders. The roll that drives the abrasive belt and which contacts the work is neoprene coated and would to a large degree conform to the surface of the sheet being ground. Since all sheets are crowned or thicker in the center, it is obvious that if they were ground in the same direction as they were originally rolled, there would be no corrective grinding to produce uniform thickness.

At Right Angles—Therefore, sections were sheared from the sheet so they could be ground at right angles to original rolling. This permitted extra grinding in the thickest sections.

Sheet sections submitted were from 0.0375 to 0.0385 inch and to remove 0.001 inch requires considerable heavy grinding. Within a short time after the job's start, it was determined how many passes could be made on a section to bring thickness near but not beyond 0.0370 inch. Then, each section was measured at a number of places so certain areas could be

behaves

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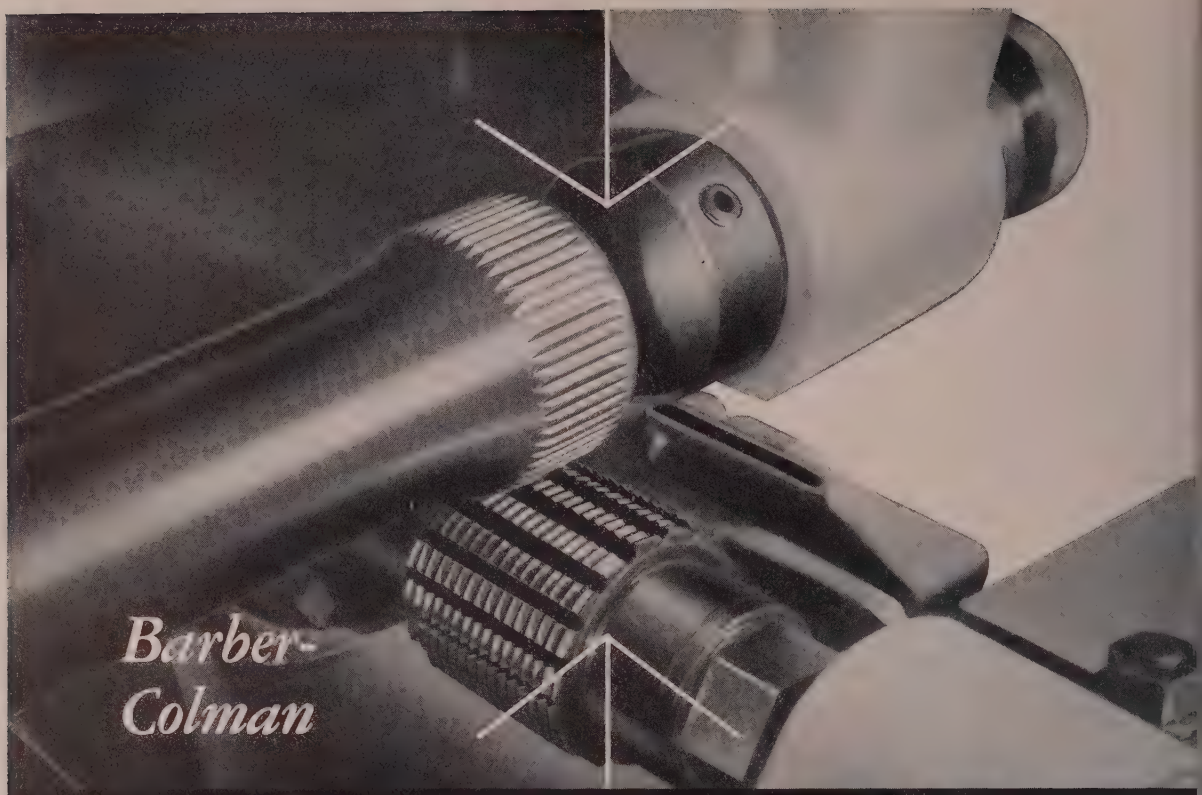

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Cuts Production Time...

Barber-Colman Hobbing Engineers, working closely with the customer on this job, combined hobs, tooling and machines for substantial tool savings and increased tool life.

New No. 16-16 Hobbing Machines, engineered with special tooling particularly for this job, are used to cut serrations on shaft ends 45-50 R.C. hardness, which approaches the upper limit of hardness for hobbing. Multi-thread Class C Accurate Unground hobs reduce tool costs considerably. The hobs are automatically shifted after each cut, resulting in an increase of 55 hobbed ends per sharpening in this hard material.

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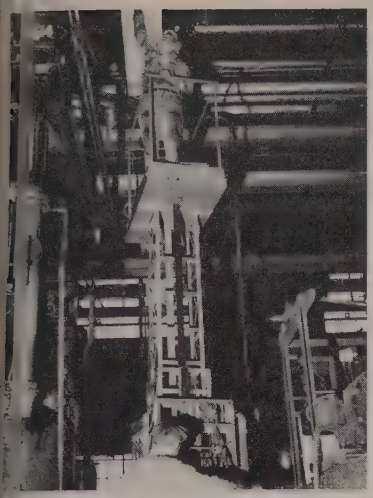

Automated Step-Ladder

This safety lift will enable a maintenance man to work at heights over 30 feet with complete safety, yet won't restrict his work. A pushbutton enables him to adjust his platform for altitude. Here electricians here are putting the Telescoper lift through its paces at the Carboloy Department of General Electric Co., Detroit, before motorizing it

---

marked for further grinding.

Finishing — After sections were ground with coarse grit belts to maximum thickness of 0.0370 inch, they were finished to No. 4 finish with finer grit belts. Finishing reduces stainless steel thickness about 0.0001 to 0.0002 inch.

Finished sections were used for fairly small parts, and almost all parts were acceptable, says J. Howell Byrnes, manager of Stainless Machine Polishing Co.

Processing Transmissions

A specialized production machine developed by Peerless Production Co. is being used by an automatic transmission manufacturer to perform drilling, chamfering and tapping operations on 160 transfer plates per hour at 100 per cent efficiency.

The two-way vertical machine has a 14-inch-way hydraulic feed unit and welded-steel tapping column and a 24-inch four-station automatic power index. Tooling is comprised of a four-station fixture, 13-spindle drilling and chamfering head and an individual single-spindle No. 19 lead-screw tapping head.

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NEW PRODUCTS and equipment

Reply card on page 159 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Gear Chamfering Machine

. . . fast setup on limited runs

A two-station universal gear deburring and chamfering machine is designed to handle all spur and helical gears as well as straight and involute external splines from ⅝ inch to 6½ inches pitch diameter.

It is adaptable to moderate-length or short-run production.

The two stations can be tooled to perform identical operations at both stations or successive steps on the same gear, or to deburr and chamfer parts totally different. Modern Industrial Engineering Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Prealloyed Steel Powder

. . . simple secondary treatment

Importance of a new prealloyed steel powder for high strength powder metallurgy applications will be shown by the ability of fabricators to produce high strength parts by briquetting and sintering without resorting to secondary treatments more elaborate than simple hardening.

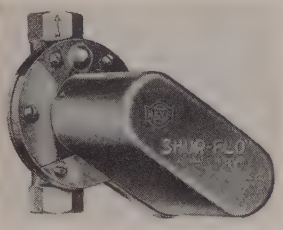
Powder has excellent green strength, according to the manufacturer, and is moldable at low pressure to yield dense, strong compacts. Ease of heat treatment, toughness comparable to alloy steel and the fact that it is not necessary to strengthen are other assets. Vanadium-Alloys Steel Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Flow Switch

. . . checks definite fluid flow

An automatic interlock flow switch, operated by means of differential of pressure across the orifice, is said by the Industrial Sales



Division to protect equipment requiring a definite flow of fluid to assure proper operation.

It will cut off equipment or signal when flow falls below safety rate; is available in ½-inch and 1¼-inch pipe sizes. Hays Mfg. Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Automatic Spray Coating

. . . positive gun actuation

Two developments by DeVilbiss make spray coating more automatic. The first is designed to move spray guns in synchronization with an article being sprayed and return the guns to a starting position so another article can be coated in the same manner. Most important factor: Positive rapid return movement of guns.

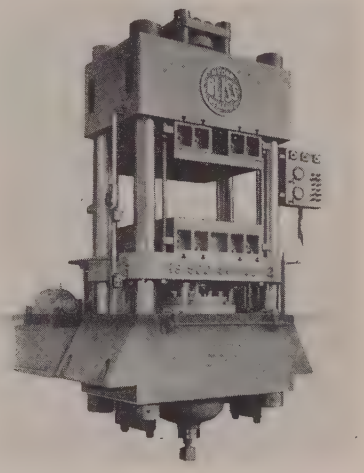
Second development is a signaling device operated pneumatically. It actuates the spray guns when an article is present on the conveyor supports of the automatic machine. DeVilbiss Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Transfer Molding Press

. . . forms in closed die

A newly-designed 500-ton hydraulic transfer molding press is made for forming plastic parts in a closed die.



Built with open tie rod construction to facilitate handling, the heavy tonnage press combines quick advance and slow pressing speeds with precise controls for forming complex plastic structures. E. W. Bliss Co.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

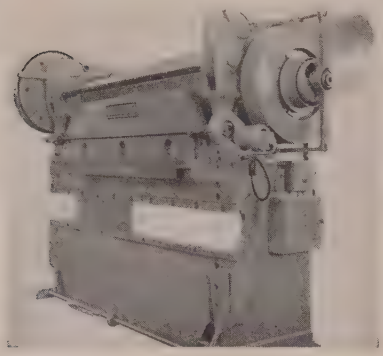
Press Brake

. . . 70 strokes per minute

A press brake, operating at 70 strokes per minute and equipped with a specially arranged ram, can be used for high speed punching and automatic feeding application.

It has all-steel rolled-plate construction, with interlocked frame,

pushbutton control to the ram adjustment, micrometer indicators on both sides of the machine, center-



line loading, weld free joints, automatic pressure lubrication. Cincinnati Shaper Co.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

AC-Type Welder

. . . for production welding

Available in 300, 400 and 500 amp NEMA rated sizes, this heavy-duty AC welder is made for production welding. It has free circuit reactor control of welding current, separate from the main transformer.

Current control mechanism operates through double reduction gear drive with a ball bearing shaft to permit rapid current selection. It can be supplied with or without power factor correction. Lincoln Electric Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Sander-Grinder

. . . for continuous service

A 7-inch heavy-duty sander grinder for continuous production service is designed to perform almost all types of surfacing operations. It can be used with abrasive discs or with a number of accessories.

Features include a motor that has 90 per cent more power than the company's former 7-inch model. The tool weighs 14 pounds. Lubricant-sealed bearings are used throughout. Another feature is

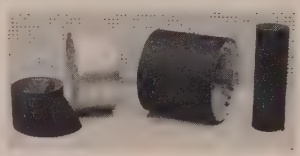
the housing designed so that air from the motor is deflected away from the operator. Black & Decker Mfg. Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Non-Slip Surfacing

. . . for industrial pulleys

A waterproof nonslip surface with mineral coating of traprock is a thin, tough fabric flexible enough to be adapted for use on any type of industrial pulley. It can be spiral-wound or applied in sections. Both types are identical, differing only in method of application.



Nature of traprock coating is such that it avoids any harsh abrasive action on belts or belt lacings, yet is abrasive enough to provide required traction. It is fire-retardant, economical and is resistant to oil, grease and water. Minnesota Mining & Mfg. Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Flooring Material

. . . unaffected by chemicals

Gam-En Wood, consists of a rubber-base plastic, made by Mechanical Goods Division, bonded to solid or laminated hardwoods. It is being manufactured in either strip or block form for industri flooring applications.

It has high abrasion resistanc Most industrial chemicals, so vents, lubricating oils and grea will not affect it. Nonconductiv fire resistant, resilient, sound a sorbent, it also has good nonsl qualities. United States Rubb Co.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CAR

Air Vise

. . . air stroke adjusts

Vi-Speed model 1000-6, lon stroke, combination air vise is heavy duty unit for conventiona holding with 6-inch jaw faces plu removable pipe jaws located in th lower jaw portions.

Jaws open to 11 inches and wi hold material up to 6 inches in d ameter in the V jaws. Powere

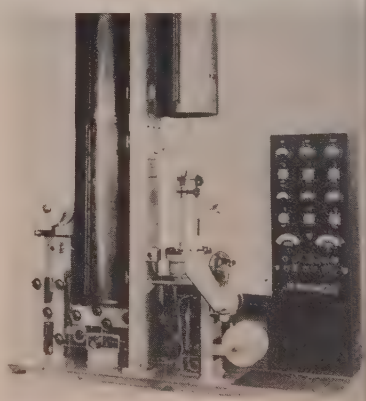
with Vi-Speed 8-inch air cylinde the air stroke is adjustable. It i mounted on a swivel base and i complete with all controls. Va Products Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CAR

Packaged Machine

. . . puts Teflon on wire

A compact, packaged machin for putting Teflon on wire ha been developed. The unit require

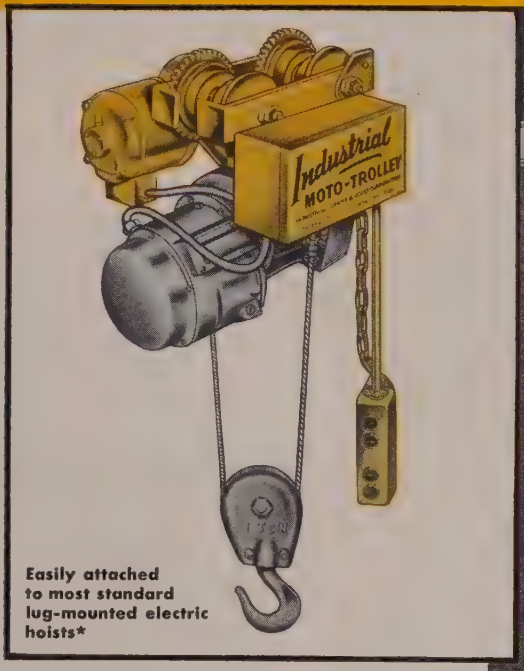


only one operator, is operated b pushbutton. It occupies a spac 9 x 3 x 14 feet, weighs about 400 pounds.

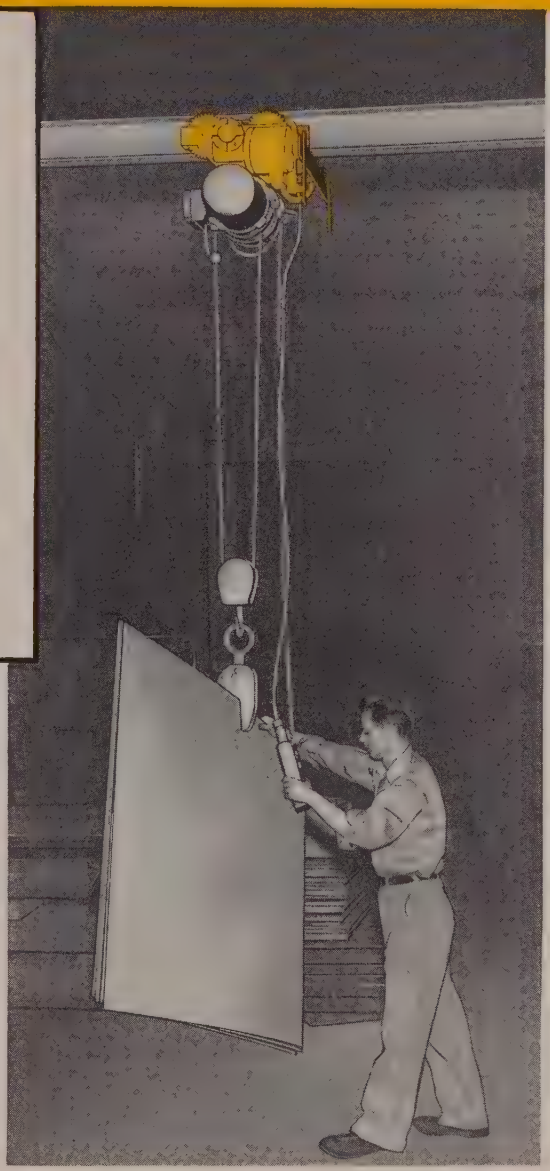
The extruder runs bare wir

Industrial

THE ORIGINAL MOTO-TROLLEY SPEEDS UP PRODUCTION *and increases* MATERIALS HANDLING EFFICIENCY



Easily attached to most standard lug-mounted electric hoists*



Sheet steel is easily and safely transported at 56 FPM — (other speeds available); push button station gives operator complete control.

The powerful ball bearing motor propels the MOTO-TROLLEY horizontally at a steady, safe, speed—overcoming the drudgery and uncertainty of hand pushing.

Well made of high quality parts, the Industrial MOTO-TROLLEY includes hardened wheels and patented removable head axles operating on precision ball bearings.

Available in 3 husky models for attachment to your standard lug mounted electric hoist in capacities from 2000 to 6000 pounds.

Single speed operation 56 or 125 FPM —2-speed models also available.

*Adjustable to operate on Standard I Beam from 6" to 12" size.

• **Send for your MOTO-TROLLEY data sheet now**

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INDUSTRIAL CRANE & HOIST CORPORATION

(formerly Industrial Equipment Co.)

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If you are willing to work only on your own ideas, you limit yourself to the capacity of one man.

Here at Johnson we have long been proud of our team. Without teamwork we could not produce the customer-satisfying volume of specialty wires. Our team is spread throughout the plant and in the laboratory, all over the plant where expert inspectors follow through each order to the shipping department where wire is wrapped with care and securely packed for shipment. Here, individual effort is compounded in the team.

JOHNSON STEEL AND WIRE COMPANY, INC.

WORCESTER 1, MASS.

New York Philadelphia Pittsburgh Cleveland Detroit Akron
Dayton Chicago Atlanta Houston Tulsa Los Angeles

A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

from a spool through an extruder unit assembly where paste Teflon is applied to wire. A vaporizing oven extracts the extrusion aid from the Teflon and the wire passes through sintering ovens where the resin is cooked to the wire, which is then wound on spool. Coating density, wire speed and oven temperatures are all regulated at the control panel. Jennings Engineering Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Warning Light

. . . for danger or noise

An electric signal light for use as a warning device in industry will indicate hazardous work areas or act as a visual communications light in noisy shops, or over long distances. It uses the principle of a colored light beam revolving

horizontally in a 360° arc, producing 100 brilliant flashes per minute.

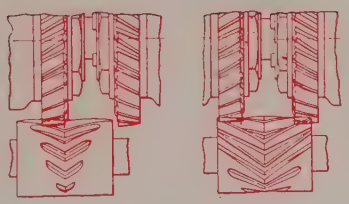
It is available with green, blue, amber and clear lenses. It is also available with a red lens, which is restricted to warning usage in locations not in conflict with official municipal or governmental warning or emergency lights. Federal Sign & Signal Corp.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Stainless Tubing

. . . ¼-inch to 5 inches OD

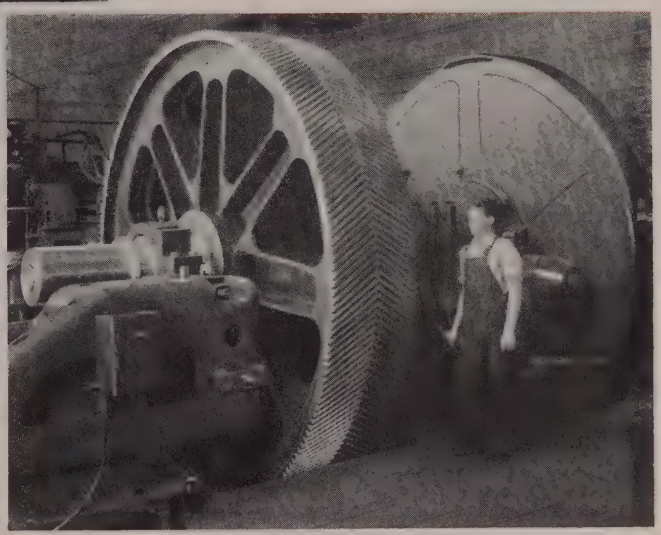
A stainless steel tubing, Unionweld, is available in commercial production from Union Steel. On several types of analyses, annealing after fabrication is unnecessary. High quality of raw materials insures good corrosion resistance on



For generating double helical gears, the Farrel-Sykes machine is equipped with two cutters mounted on a single carriage. The cutters reciprocate, each ending its stroke at the center of the blank. As they cut, they twist to generate the helices and also slowly revolve in unison with the gear blank to generate the tooth contours precisely. For single helical gears one cutter is used, and for spur gears either one or two cutters may be used.

how precision gears Get Precision

rel-Sykes machine generating an internal single helical gear.



Generating a large herringbone gear in the Farrel-Sykes machine.

Precision comes to gears through the machine that makes them. It is passed on to Farrel® gears by the Farrel-Sykes Gear Generator, the operating principle of which (precision generation) gives the gears accurate tooth spacing, profile and helix angle. Because of this you can be sure that Farrel gears will operate smoothly, quietly and efficiently throughout a long service life.

Farrel continuous tooth herringbone gears are made in any size from ¼″ to 20′0″ diameter, for any power capacity and speed. Also available are straight tooth and single helical gears in sizes up to 20′0″ in diameter, and large internal gears with either spur or helical teeth.

Farrel engineers will be glad to assist you in working out unusual gear problems.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-876

Farrel-Birmingham®

the job. Tubing is produced in a size range ¼ inch to 5 inches OD, with wall thickness of 0.010 to 0.154-inch. Union Steel Corp.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Recording Instruments

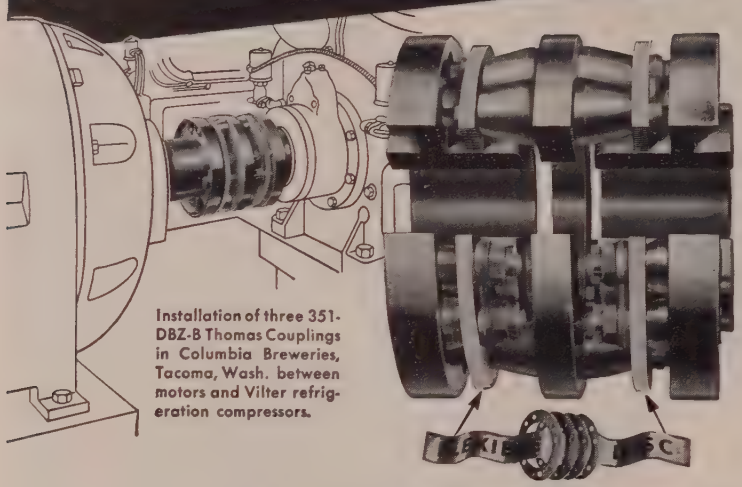
. . . measure three ranges

The SR-4 strain scanning and recording instrument is intended to meet a demand for means of reducing time and skill required during testing projects requiring numbers of strain gages.

Recorder provides three ranges of measurement and can handle gages with mixed resistances ranging from 60 to 500 ohms. Scanner unit contains electrical circuits and controls for switching. In addition to fully automatic operation of the system, it can be manually advanced through each gage channel, one at a time. Baldwin-Lima-Hamilton Corp.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

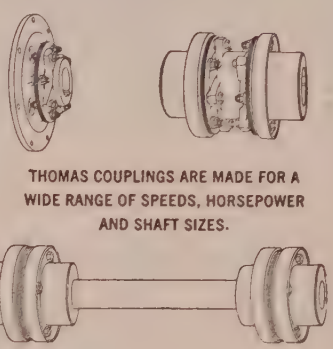


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.

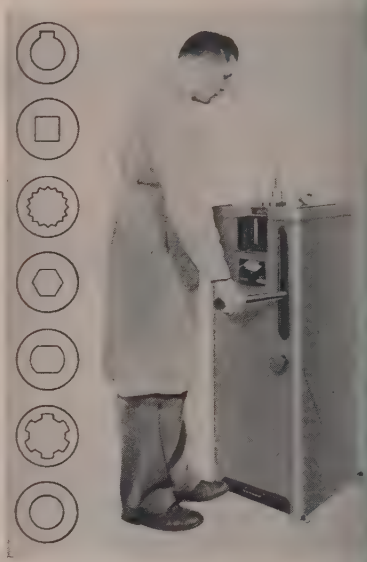
Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

Hand Broaching Machine

. . . hand operated, hydraulic

A hand - operated hydrauli broaching machine is built to fi the needs of all types of manufac turing operation. It can be set u



in a few minutes to cut keyway or square, oblong, hexagon, irregu lar, splined or round holes.

Up to 2 tons of hydraulic pullin power is developed by actuatin the hand lever of the VH-215. I has a stroke of 15 inches, an worktable surface is ample. Ma chine height is 42 inches and i weighs approximately 250 pounds Pioneer Broach Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Gear Gage

. . . new way to inspect

A new approach to inspectin pitch diameters of spur gears helical gears, splines and chai

sprockets is used in a gear gag developed by Federal Products.

Cylindrical gaging contacts ar used on the gage, and the uppe

UNITED®

Slabbing Mill

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H-VW-M *Generators not only meet standards -they make 'em!*

Yes, today's performance standards are higher than ever for motor generator sets. And the final examinations that *all* H-VW-M low voltage motor generators must pass before delivery have consistently raised industry standards for voltage regulation, power factor correction, overload capacity, and exceptionally long and efficient life for all parts. It's a painstaking, exacting process, but the net result is a line of generators that can't be beat.

Manufacturing top-quality generators is only one of many results of over eighty years of constant electroplating development — a continuing policy summed up in H-VW-M Platemanship...your working guarantee of the best that industry has to offer—not only in plating—current generators—but in every phase of plating and polishing.

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For full information on all H-VW-M Low-Voltage Generators, ask for Bulletin G-102.

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

is free to swivel while adjusting it to the master. When it is ted properly in relation to the er contact, it is locked in posi- n. The arrangement is said to vide for more stability. An ad- table rear guide helps to locate gage in proper spaces between gear teeth. Federal Products rp.

MORE DATA CIRCLE NO. 17 ON REPLY CARD

ated Pump

. . steam, electrical heat

The Corson-Cerveny heated mp can be equipped with steam electrical heating, or a combina- on of both. Its purpose is to sup- y plants with a metering pump at will handle small volumes of scous materials.

The unit operates the same as e Corson-Cerveny Micro-Bellows

ump and can be adjusted for vari- us rates while in operation. Jack- ted burrett is supplied for check- ng flow rates and the level in the eated charger. Research Appli- nce Co.

OR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Multi-Purpose Hose

. . for air-operated tools

A new multi-purpose rubber hose vill conduct air, oxygen, acetylene, vater, oil, grease, gasoline, kero- ene and many dilute chemical and cid solutions. Republic recom- nends it for use on air-operated ools and for all types of water ervice.

An oil-resisting Reprene com- ound is used for tube and cover of Conductall. Carcass is rein- forced with braided rayon cords chosen for strength and long service life. Lead press cured black cover is molded smooth for easy handling and long wear. Sizes range from 3/16 through 1½ inch ID. Republic Rubber Division, Lee Rubber & Tire Corp.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Protective Coatings

. . . applied by single dip

Five protective coatings for zinc, silver, copper and aluminum provide a new method of obtaining a bright decorative and protective finish directly on zinc diecastings, good tarnish resistance for industrial silver plate, greater corrosion resistance and paint adherence for copper and copper alloy surfaces and a better protective coating for aluminum.

The new coatings are applied by a simple chemical dip, without electrolysis and without need for spe-

"Switching to NILSON 4 SLIDES Saved us $17,656 on metal alone"
Yes, simply by changing stamping methods, this NILSON Customer profited 4 ways:
1. Production increased 80%.
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NILSON 4 SLIDES available in wide range of sizes: forming Wire up to ½" diam. in feeds to 32" max. and Metal Ribbon stock up to 3½" wide. Press sections 5 to 30 ton capacity. Heavy Duty Types in 50 and 75 ton models.
MODEL S-3-F Nilson 4 Slide with No. 51B Nilson Tilting Stock Reel.
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Your Kaiser Aluminum Distributor is geared to meet your emergency needs, to go to work for you the minute you call. And, if you want to borrow on his experience, he can also specify the exact type of aluminum your product requires. He can suggest methods of using aluminum more economically. He can supply you with small quantities for experimental work.

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Merrill Aluminum Corporation

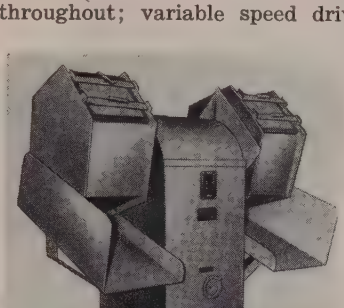
cial equipment or specially-trained personnel. Allied Research Products Inc.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Barrel Finisher

. . . 4-cubic-foot capacity

A twin precision barrel finisher, with 4-cu-ft capacity includes such features as: Sealed ball bearings throughout; variable speed drive



from 12 to 36 rpm; magnetic starter; hexagonal steel burring barrels constructed from 10-gage steel.

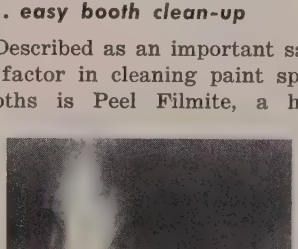
Tote boxes can be furnished in place of moveable chutes if desired. Barrels can be lined with vinyl plastic, if specified. Rampe Mfg. Co.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Spray Booth Coating

. . . easy booth clean-up

Described as an important safety factor in cleaning paint spray booths is Peel Filmite, a high



strength white plastic film that gives excellent adherence to metal surfaces. Flame-proof, it provides for greater paint loads, coverage and shows no true flash point at 75° F.

Easy to spray on and easy to peel off, it saves manhours in booth clean-up. It is sprayed on by using regular paint spray equipment with a 20 to 30-pound pressure on the fluid line and 80-pound air pressure. DuBois Co. Inc.

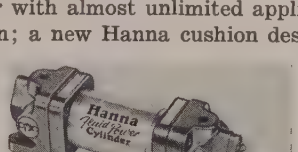
FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Air, Hydraulic Cylinders

. . . with easy adjustment

New fluid power cylinders, featuring large capacity-to-size ratio, are identified as the 750 series.

Among the features incorporated are: A more compact cylinder with almost unlimited application; a new Hanna cushion design



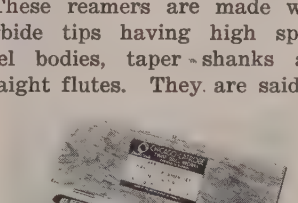
with positive easy adjustment; reduced friction consistent with positive sealing. Hanna Engineering Works.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Carbide-Tipped Reamers

. . . for Rockwell 40C or higher

These reamers are made with carbide tips having high speed steel bodies, taper shanks and straight flutes. They are said to



ream accurate holes in hardened Rockwell 40C scale or higher hardness.

Size range is ¼, 5/16, ⅜, ½, ⅝ and ¾-inch. Also furnished in sets as illustrated consisting of sizes ¼, 5/16, ⅜ and ½-inch, contained in a hinged oak case for protection and availability. Chicago Latrobe, division of United Drill & Tool Corp.

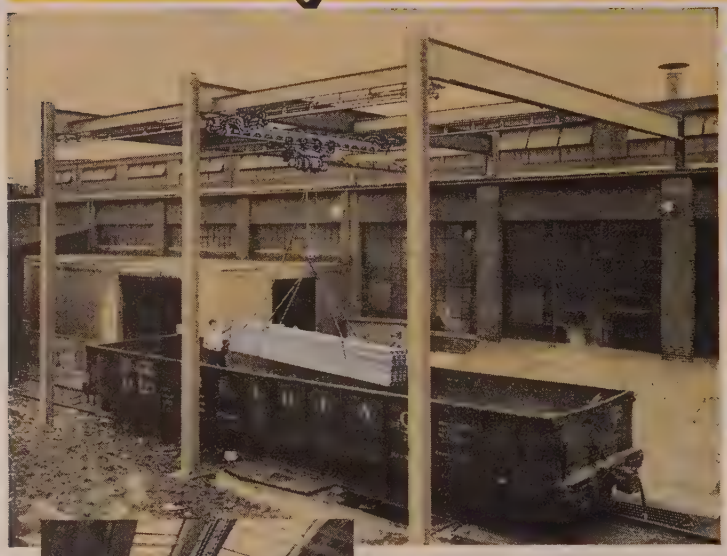
FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Template Set

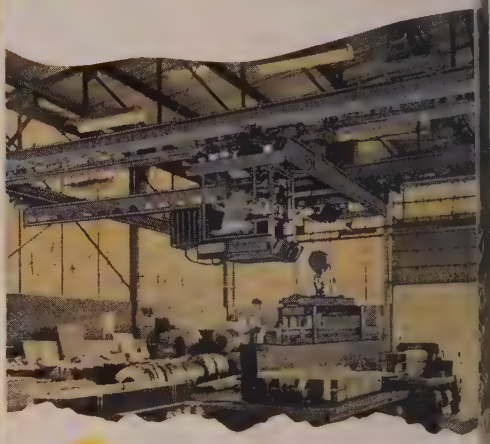
. . . determines dimensions

A five-piece template set for use in technical illustration work provides a uniform, positive system for determining dimensions of

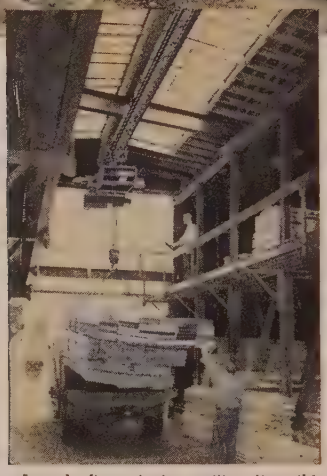
Big Savings



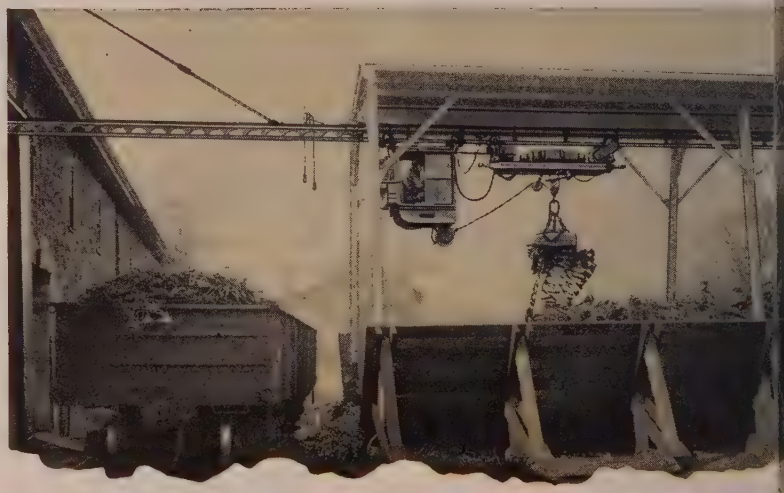
2-ton bundles of 18-foot steel panels are quickly loaded into railroad cars with the Tramrail crane which operates over loading dock and railroad tracks.



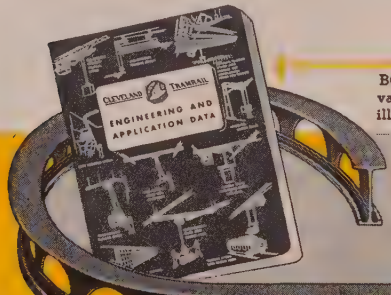
5-ton loads of sheet steel are picked up from tr with the motor-operated grab controlled by the cab oper Trucks that formerly required 3 to 3½ hours to unload are usually gone in 20 minutes.



In only five minutes waiting time this truck is loaded with lumber and ready to go. Up to 5,000 ft. weighing 10,000 lbs. are expedited in this manner. Two hours truck time is saved with the electric Tramrail hoist carrier on every load.



A simple wall-type jib transfer crane enables transporting one-ton loads of scrap by magnet from building to gondola ca or to storage bins on other side of track. It is swung back and locked to building when a locomotive passes through. Shee steel and other steel items can also be handled by Tramrai magnet carriers.



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OVERHEAD MATERIALS HANDLING EQUIPMENT

N BE MADE ON LOADING!

HERE ARE 10 WAYS THAT CLEVELAND TRAMRAIL SYSTEMS

Pay off in the loading of Cars and Trucks

Cleveland Tramrail equipment engineered to suit your truck or railroad loading and unloading most likely will provide you with one or several of the following advantages:

Permit handling larger units at a time, i. e., greater weights, more pieces.

Enable moving them in a fraction of the time required by ordinary hand methods.

Drastically reduce hours required for loading or unloading.

Provide direct delivery to or from warehouse or point of work without time-consuming reloading to other conveyances.

Reduce or eliminate railroad car demurrage.

Minimize idle loading time of trucks and increase effective hauling time—thus, more can be hauled with a truck per day.

Often save need of purchasing additional trucks because of more effective use of present ones.

Expedite deliveries to customers and thereby gain good will.

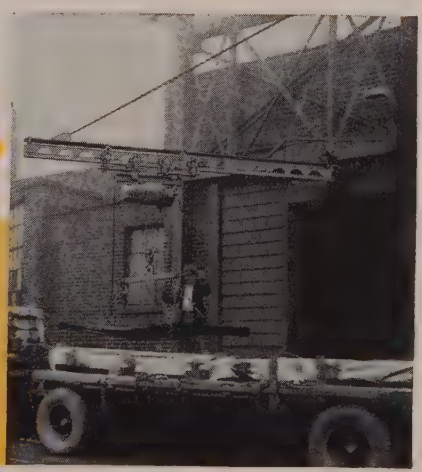
Cut purchase price of some materials by buying them packed in larger units.

Improve safety by eliminating accidents caused from heavy, manual handling and lifting.

with a great many Cleveland Tramrail car and truck loading installations has proven that they pay big dividends. Check *your facilities* and ascertain how many of the above advantages you could secure with properly engineered overhead Tramrail equipment . . . and discuss it with a Cleveland Tramrail representative.

3-ton packages of steel are picked up with the hand-operated grab and delivered to various points in the building on the overhead track system.

Steel sheets are unloaded easily with this 3-ton swinging transfer jib crane which permits carrier with load to be run onto track system inside building and delivered direct to storage. When not in use the jib crane is swung against wall, out of the way.



CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7875 East 284th St. Wickliffe, Ohio

lines and angles in pictorial drawings. No involved projection, mathematical calculations, graphs or special boards are required. Even curves, radii and ellipses are determined by use of the templates alone.

It enables draftsmen to draw views of an object from any angle with exact proportionately-correct dimensions. Use is quickly grasped by any draftsman without special training. Charles Bruning Co. Inc.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Ball Seat Gage

. . . checks to close tolerance

A ball seat gage made by Brown & Sharpe checks dimensions of ball seats on the forward mounting struts on airplane engines which must be held to very accurate tolerances. It is accurate in checking inside diameter of ball seats in ten-thousandths of an inch.

Gaging dimension is transferred to dial indicator by an auxiliary plunger which rides on a cone at the back end of the gaging point. This point and the plunger are held against the working surface and gaging point by a spring. Brown & Sharpe Mfg. Co.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Elastic Coating

. . . for light duty

An elastic maintenance coating is introduced by Atlas for light duty corrosion service.

The product, which eliminates compounding on the job, is available in gray or black colors, in standard containers. The material, called Elprene, is based on a joint development by Du Pont and Atlas. Atlas Mineral Products Co.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Relpy card on page 159 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Flanged and Dished Heads

Lukens Steel Co. — Elliptical flanged and dished heads of ASTM A-212-B Firebox steel have been added to Lukens' list of stock heads. For fabricators and designers, the company has published its revised complete head stock list, reporting data on spun and pressed heads for immediate shipment, in a 4-page brochure.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Torque Limiters

Morse Chain Co.—An 8-page, illustrated, two-color catalog describes the torque limiter, the device that provides automatic overload protection for machinery drives. Design and operation information is given along with specification tables for a line of eleven standard models having torque capacities from 20 to 620 foot-pounds. Typical applications are listed.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Tetrafluoroethylene Fiber

E. I. DuPont de Nemours & Co. Inc.—Teflon fiber, resistant to heat and chemicals, is described in a new bulletin. Physical properties of fibers from Teflon, room temperature properties of fibers from Teflon after exposure to hot and corrosive liquids and high temperature properties of the fibers are given in tabular form. A tabulation of filament yarn properties is also included.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Precision Metalworking

O'Neil-Irwin Mfg. Co.—Faster, more economical ways to form and fabricate materials through use of DiAcro precision metalworking machines are described and illustrated in an 8-page booklet. "Quic Facts to Aid In Selecting Die-Les Duplicating Equipment" gives concise summary on both hand an power-operated benders, brake notchers, punch presses, rod part ers, rollers and shears.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Pitch Diameters

Sheffield Corp.—Gage Divisio offers a slide rule designed t make it easy to select proper pitc diameters for American or Unifie thread plug or ring gages.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Stainless Alloys

Cooper Alloy Foundry Co.—Nev technical booklet consisting of 1 reference sheets covering majo stainless alloys gives the follow ing information for each alloy Chemical composition, mechanica and physical properties, resistanc to major corrosive solutions, ma chinability, heat treatment an weldability. Equivalent ACI, AIS SAE and ASTM designations ar given.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

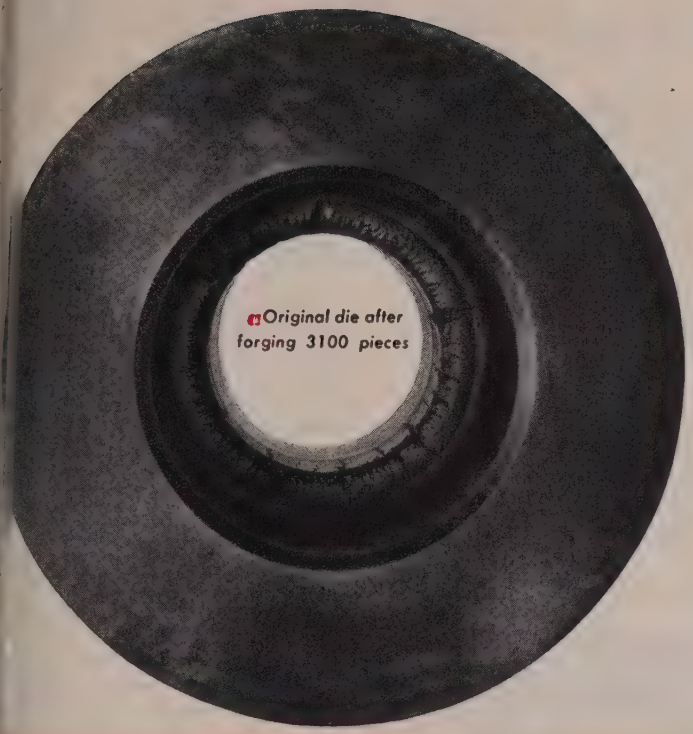
Acetogen Gas

Acetogen Gas Co.—Literatur describing Acetogen Gas is avail able to show applications wher the product promises advantage over acetylene. Patented system o mixing the gas, and the stron points of using the system ar covered.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Jaw Crushers

Pioneer Engineering Works Inc —New developments and improve features of design to increase ef ficiency and reduce operating cost are covered in a 48-page bookle covering Pioneer's broad line o overhead eccentric jaw crusher



CRUCIBLE REXWELD hard surfacing rods increased forging die life OVER 400%

for R. G. LeTourneau, Inc.

By Rexwelding, R. G. LeTourneau, Inc., Longview, Texas, increased the life of its production dies over 400%. The dies shown, for example, used to forge a plug adapter of SAE 1030 steel at 2350 F, had to be removed from the press after forging 3100 pieces because of excessive wear and heat checking. The same die, after worn areas were machined out and faces built up with Rexweld-A hard surfacing rod, produced 9300 pieces.

You can do the same in your shop. You'll find that Rexwelded dies have higher edge strength at elevated temperatures, and resist chipping, deformation and heat checking better. And parts can be Rexwelded over and over.

So, use Rexweld Rods on your next hard surfacing application. They are available in both bare rods and low hydrogen coated electrodes, in a wide range of grades and sizes. Call your local Crucible representative — he can provide a grade of Rexweld adapted to your specific job.

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54 years of *Fine* steelmaking

REXWELD HARD SURFACING ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

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Whether you are a "gear expert" or not, we believe it will pay you to check with FAIRFIELD on your current and future requirements for gears. Fairfield is one of America's largest independent producers of fine gears *made to order* for all kinds of modern machinery. *Your inquiry will receive prompt attention.*

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and 170 series stationary prima plants. Numerous product illu trations, cutaways and job photo dimension and footing drawing tables on capacity, toggle and ja plate selection and specs are i cluded.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CA

Electreat

Jones & Laughlin Steel Corp.— Electreat, J & L's heat-treat cold-finished steel, is described a new catalog. The method of he treating cold-finished steel ba utilizing an electric induction hea ing and quenching machine is co ered with advantages of the met od and its exclusive features.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CA

Double-Flaring Tools

Imperial Brass Mfg. Co.—Co plete descriptions of the 45 and 3 degree double-flaring tools are i cluded in Catalog No. 3011-A. I cluded also are cutting, bendin reaming, swedging, pinch-off a refacing tools. Detailed descri tions are accompanied by illustr tions.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CA

Low-Lift Truck

Elwell-Parker Electric Co.— low-lift platform truck equipp with four-wheel steering is d scribed in a 4-page folder. F illustrations, diagrams and co struction details are included.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CA

Dryer and Cooler

Link-Belt Co.—Roto-Louvre, te dryer, cooler or dryer-cooler, is described in a 20-page book. It e plains that the fundamental phy cal laws of heat transfer are te basis for each function of te Roto-Louvre and goes on to tell how it follows these laws.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CA

Impact Plastic

Fiberite Corp.—A description "Fiberite 4030," (a reinforced phenolic, fiber-glass high impact thermo-setting plastic material), samples of the material and engineering advice are offered by the company.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CA

Drilling Machines

Bryant Machinery & Engineering Co.—A 12-page catalog gives complete information in large-size

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rations and concise descriptive ter on Cleereman drilling ma- nes. It is designed to supply the facts a prospective user ld require for exact knowledge comparison.
MORE DATA CIRCLE NO. 41 ON REPLY CARD

tor Starters

lectric Controller & Mfg. Co.— ooklet illustrates starters using company's 50,000-kva inter- ing capacity type ZHS con- ctor and Valimitor starters. y will safely interrupt the cir- t from a bus of unlimited ca- ity. Booklet describes motor rters having short circuit pro- tion for 2200 to 5000-v sys- ns. Photographs of indoor and door installations are included.
MORE DATA CIRCLE NO. 42 ON REPLY CARD

aterials Handling

Stewart-Warner Corp.—Alemite vision offers a 32-page catalog "Versatal" materials pumping e. Functions of the equipment a typical system are covered. ccessories and information con- rning testing of materials to de- rmine whether they can be han- ed by these pumps are included.
R MORE DATA CIRCLE NO. 43 ON REPLY CARD

ower Drives

Sterling Electric Motors Inc.— photographs of their power rives on machinery and equip- ent of many kinds are included a new brochure. Pages have een divided by industry and in- lude application stories. Photo- raphs carry captions giving re- ume of the manufacturer, user nd production advantages.
OR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Air Compressors

Joy Mfg. Co.—A 36-page bulletin n Joy series 100, Class Wn-114, heavy-duty air compressors for industry contains complete information on construction and operation of the compressor. Illustrated are seven models as a single unit for displacement capacities from 1186 to 1948 cfm, as well as twin units which furnish up to 3896 cfm.
FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Electrode Assemblies

Leeds & Northrup Co.—"pH Electrodes and Electrodes for Measuring Redox Potentials—Assemblies, Parts and Accessories" covers their complete electrode line, chemicals for electrode servicing and auxiliary electrode equipment. It is designed to present electrode assemblies for measurement, recording and/or control of solution pH and redox potentials.
FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Metal Blast

Metal Blast Inc.—A brief description of Annealshot grit and its advantages are covered in a 4-page brochure. The company also offers a 4-page brochure on cut steel, what it is, what it's made from and what it will do.
FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

Transformer, Reactors, Filters

United Transformer Co.—This company offers a 26-page catalog presenting the complete line of UTC transformers for broadcast, amateur, laboratory and replacement purposes. Illustrated are a few special transformers, reactors, filters and magnetic amplifiers for military equipment.
FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

Precision Tools

Erickson Tool Co.—Complete specifications on model dimensions and ranges are given for their

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT — PAGE

NAME — TITLE

COMPANY

PRODUCTS MANUFACTURED

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

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line of chucks, holders, mandrels, air cylinders, speed indexers, cutting bars and special holding fixtures in the 34-page "Precision Tools, Catalog K." It's profusely illustrated with actual use photos and detailed, cutaway drawings.
FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

Screw Machine Work

Avalon Machine Products Inc.—Screw machine operations and where to get them are described in a limited edition written for end product and component part manufacturers who have difficulty securing precision automatic screw machine work. Photo of various parts turned out and operational views are included.
FOR MORE DATA CIRCLE NO. 50 ON REPLY CARD

Aluminum Castings

Aluminum Alloys Corp. — 12-page catalog is designed to tell why this company can be considered expert in the field of aluminum castings. Step-by-step procedures in the manufacture of the castings are supplemented with photographs that illustrate production of uniform and high standard castings.
FOR MORE DATA CIRCLE NO. 51 ON REPLY CARD

Floating Holders

Scully-Jones & Co.—A new catalog on their new JT lock and eject collet-type floating holders is offered. Six pages describe it in detail and include specifications and prices of the assemblies without chucks.
FOR MORE DATA CIRCLE NO. 52 ON REPLY CARD

Power Transmission Equipment

Lovejoy Flexible Coupling Co.—Lovejoy offers a 24-page catalog on their power transmission equipment. Variable speed pulleys, wide v-belts, sheaves, motor bases, countershafts and Select-O-Speed transmission are covered. Ratings and dimensions, representative applications and schematic drawings are included with each type.
FOR MORE DATA CIRCLE NO. 53 ON REPLY CARD

Lagging Adhesives

Benjamin Foster Co.—A reference manual on lagging adhesives, sealers, surface coatings, fire retardant mastics and vapor barriers indexes Foster manufactured products for use with all types of insulation in the marine and industrial field. Technical

product data, application specifi. tions and a request form are cluded in the 20-page refere manual.
FOR MORE DATA CIRCLE NO. 54 ON REPLY C

Spinning, Hydroforming

Roland Teiner Co. Inc.—A b chure is offered by Roland Tei covering the history of metal sp ning and the company's approa to it. Their experimental sh and other facilities are described 18 pages.
FOR MORE DATA CIRCLE NO. 55 ON REPLY CA

EDITORIA REPRINTS

Metalworking Growth

U. S. metalworking, the wor largest single industry, has sho rapid growth since 1939. Do know where and how it has grow On pp. 66-67 are summarized major facts about gains over t past 15 years, to help you in yo distribution problems.
FOR MORE DATA CIRCLE NO. 56 ON REPLY CA

Seaway to Opportunity

The St. Lawrence Seaway is a new channel for business. Some the ways the seaway may aid y appear on pp. 74-75. This is t third in a three-part series.
FOR MORE DATA CIRCLE NO. 57 ON REPLY CA

Carbide Tool Selection

Selection of the right carbi grade is part of the solution o the carbide problem, says this a cle appearing on page 124. Cut r selection must be equated to b requirements. Tool type, shape a carbide grade are all variab The article explains why gra choice can be based on wear ch acteristics.
FOR MORE DATA CIRCLE NO. 58 ON REPLY CA

Quenching Fundamentals

Fundamentals of quenching w be given in two articles the fi of which begins on page 110. t explains how batch handling p s a load on the quench system a emphasizes the fact that in or r to get full and uniform hardn layout of the system must be th ough and the equipment must e the right size.
FOR MORE DATA CIRCLE NO. 59 ON REPLY CA

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9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

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Market Outlook

STEEL production continues its moderate uptrend. In the week ended yesterday STEEL's national rate edged up to 71 per cent of capacity, highest level since late February. That is an increase of 0.5 point over the preceding week.

While ingot output is still around 30 percentage points below this time a year ago, operations currently are on the upgrade, whereas a year ago they were beginning to decline to the lower levels prevailing for the last 12 months.

THE CAUSES—The improvement in ingot output stems from continued completions of inventory reductions of steel and the generally stronger tone of business. Practically none of the strengthening comes from protective buying against a steelworkers' strike.

BACK TO WORK—In the Chicago area, two wire producing plants called back some employees who were furloughed earlier this year. Demand for merchant wire products is sustained at a fairly good level there, and sales of manufacturers' wire is improving moderately. Part of the improved volume of demand for manufacturers' wire comes from makers of springs. Wire producers were among the first to feel the drop last year in steel demand.

Standing out sharply as a strong taker of steel this year is the construction industry. Demand for structural shapes is fairly strong. Fabricators of structurals note an increasing amount of new inquiry, which likely will be translated into demand for steel over the next few months.

LIVELIER—In most areas, buying of hot-rolled and cold-rolled carbon steel sheets is a shade livelier than it was a month or so ago. In one area, bookings of cold-rolled carbon sheets are running 10 to 15 per cent heavier than in May. Galvanized sheets are the most active of all light, flat-rolled steel products; in most cases orders placed now will not bring delivery before August. Makers of consumers' goods are taking 10 per cent more carbon strip than they took a month ago.

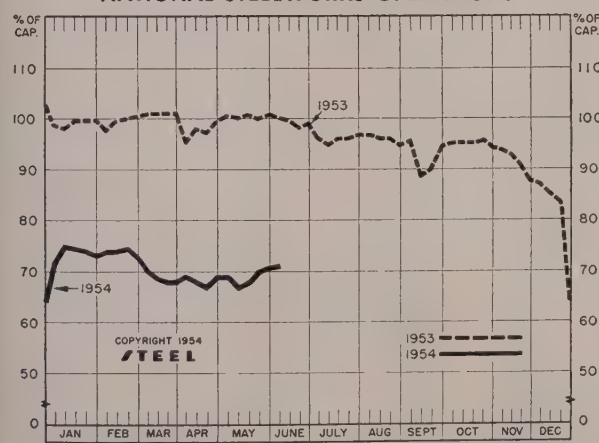
SMALL BUT NUMEROUS—Warehouses, suppliers of steel to small users, are receiving a substantial number of orders, but they are small. One warehouseman commented that consumers' placement of orders in small but frequent lots has exhausted his supply of invoices three times this year. He has used as many invoices as he ordinarily uses in six months.

SQUEEZED—Warehousemen say the extra work involved in handling small orders and the keen competition they are encountering are cutting profits. Some of the small warehouses are reported to be in a tight financial squeeze.

PRICE PICTURE—While steel sellers are absorbing freight on their sales as a means of meeting competition, the standard base prices of steel are remaining firm. This is reflected in STEEL's finished steel price composite, which holds at $113.70 a net ton.

After a week's pause, the price of steelmaking scrap moved up again and raised STEEL's price composite to $28.50 a gross ton, a 33-cent rise. Tending to restrain the upward movement of scrap prices is the idleness of 35 per cent of the country's blast furnace capacity. Steelmakers can substitute hot pig iron for scrap anytime they feel it is economically desirable to do so.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 6	Change	Same Week 1953	Same Week 1952
Pittsburgh	65	— 4*	96.5	23.5
Chicago	83.5	— 0.5*	105.5	37
Mid-Atlantic	58	0	98	46
Youngstown	69	+ 1	105	28
Wheeling	69.5	14	100.5	61.5
Cleveland	69	— 1.5*	104	25
Buffalo	67.5	0	106.5	12
Birmingham	71	— 5.5	101	28
New England	52	+ 2	90	28
Cincinnati	67.5	— 1	99	69.5
St. Louis	64.5	0	89	55
Detroit	72.5	+ 3.5	107	45
Western	80	+ 5	109	51
National Rate	71	+ 0.5	100	37.5

INGOT PRODUCTION‡

	Week Ended June 6	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	105.2†	105.7	103.0	139.8
NET TONS (In thousands)	1,690†	1,498	1,654	2,246

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,440 in 1952.

The Metalworking Outlook—p. 55

Technical Outlook—p. 105

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended June 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For com description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400
Rails, light, 40 lb	5.767
Tie Plates	5.125
Axles, railway	7.250
Wheels, freight car, 33 in. (per wheel)	47.000
Plates, carbon	4.550
Structural Shapes	4.367
Bars, tool steel, carbon (lb)	0.415
Bars, tool steel, alloy, oil hardening die (lb)	0.505
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550
Bars, H.R., alloy	$3.575
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	4.873
Bars, reinforcing	4.900
Bars, C.F., carbon	7.974
Bars, C.F., alloy	10.975
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.755
Sheets, C.R., carbon	5.696
Sheets, galvanized	6.965
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	9.000
Strip, C.R., carbon	7.229
Strip, C.R., stainless, 430 (lb)	$0.415
Strip, H.R., carbon	4.963
Pipe, black, buttweld (100 ft)	14.454
Pipe, galv., buttweld (100 ft)	17.731
Pipe, line (100 ft)	141.960
Casing, oil well, carbon (100 ft)	149.516
Casing, oil well, alloy (100 ft)	214.113
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon (100 ft)	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	$
Tin plate, electrolytic, 0.25 lb	
Black plate, can making quality	
Wire, drawn, carbon	
Wire, drawn, stainless, 430 (lb)	
Bale ties (bundle)	
Nails, wire, 8d common	
Wire, barbed (80-rod spool)	
Woven wire fence (20-rod roll)	

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 1 1954	May 25 1954	Month Ago	May Average
(1947-1949=100)	140.9	140.8	140.8	140.8

STEEL's FINISHED STEEL PRICE INDEX*

	June 2 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1953-39 av.=100)	189.75	189.75	189.74	182.82	154.01
Index in cents per lb	5.140	5.140	5.140	4.953	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	June 2 1954	Week Ago	Month Ago	Year Ago	5
Finished Steel, NT*	$113.70	$113.70	$113.70	$111.28	$
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	
Steelmaking Scrap, GT	28.50	28.17	27.33	39.50	

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 2 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	4.405	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.40
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.50
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.50
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.25
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	June 2 1954	Week Ago	Month Ago	Year Ago	5 Y A
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47
Basic, Valley	56.00	56.00	56.00	54.50	46
Basic, deld. Phila.	59.66	59.66	59.66	59.25	49
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46
No. 2 Fdry, del. Phila.	60.16	60.16	60.16	59.75	49
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	39
No. 2 Fdry(Birm.) del. Cin.	60.43	60.43	60.43	58.93	45
Malleable, Valley	56.50	56.50	56.50	55.00	46
Malleable, Chicago	56.50	56.50	56.50	55.00	46
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	200.00†	175

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$30.50	$30.50	$28.50	$39.50	$2
No. 1 Heavy Melt, E. Pa.	23.00	23.00	23.00	41.50	21
No. 1 Heavy Melt, Chicago	32.00	31.00	30.50	37.50	21
No. 2 Heavy Melt, Valley	29.50	29.50	29.50	41.50	22
No. 1 Heavy Melt, Cleve.	28.50	28.50	26.50	39.00	18
No. 1 Heavy Melt, Buffalo	26.50	25.50	25.50	40.75	21
Rails, Rerolling, Chicago	44.00	42.00	41.00	47.50	27
No. 1 Cast, Chicago	38.50	38.50	38.50	38.00	27
COKE, Net Ton					
Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$14
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	17.00	16
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 13, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 27.00-27.50 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.125 del. Midwest; Lake 30.00 del.; refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.05, chemical 14.15, roding 14.15, St. Louis; New York basis, 0.20.

Lithium: 98%, $11-$14 per lb, depending quantity.

Magnesium: 99.8%, selfpalletizing pig notched ingot 27.75, 10,000 lb or more, Freeport, Tex. For Port Newark, N. J., Madison, Ill., add 1.20 for pig and 1.25 ingot. Sticks, 1.3 in. diameter, 46.00, 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, and R 32.50; alloy M 34.50, 10,000 lb or f.o.b. Freeport, Tex., or Madison, Ill. 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New $265-$270, nom., per 76-lb flask.

Molybdenum: Powder 99% hydrogen $3.40 per lb; pressed ingot $4.06 per sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x and larger), unpacked 60.00; 25-lb pigs "XX" nickel shot 63.65; "F" nickel

DAILY NONFERROUS PRICE RECORD

	Price June 2	Last Change		Previous Price	May Avg.	Apr. Avg.	June 1953 Avg.
Copper	30.00	Apr.	12	29.75-30.00	30.000	29.955	29.875
Lead	14.05	June	2	13.80	13.800	13.710	13.213
Zinc	10.50	May	26	10.25	10.290	10.250	11.000
Tin	94.00	June	2	93.75	93.600	96.260	92.918
Nickel	60.00	Jan.	14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July	15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar.	9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

for addition to cast iron, 60.00; prices Port Colborne, Ont., including import New York basis, add 0.92.

um: $140-$150 per troy oz nom.

lium: $21 per troy oz.

aum: $84-$87 per troy oz from refineries.

m: $16-$21.50 per mg radium content, ding on quantity.

ium: $125 per troy oz.

enium: $70-$75 per troy oz.

dium: 99.5%, $5-$6 per lb.

m: 16.50, carlots; 17.00 l.c.l.

alum: Sheet, rod $39.00 per lb; powder 0 per lb.

rium: $1.75 per lb.

lium: $12.50 per lb.

Straits, New York, spot, 94.00; prompt,

nium: Sponge, 99.3+%, grade A-1 ductile % Fe max.) $4.72; grade A-2 (0.5% Fe) $4.46 per pound.

sten: Powder, 98.8%, carbon reduced, lb lots $4.65 per lb f.o.b. shipping point; than 1000 lb $4.80; 99+% hydrogen re- d, $4.95. Treated ingots $6.70.

: Prime Western 10.50, brass special 10.75, mediate 11.00, E. St. Louis, freight al- d over 0.50 per pound. High grade 11.85, al high grade 12.00, die casting alloy t 14.50, del.

nium: Sponge $10 per lb; powder elec- ics grade $15, flash grade $11.50.

te: Chromium, manganese and silicon met- are listed in ferroalloy section.)

CONDARY METALS AND ALLOYS

inum Ingot: Piston Alloy 19.20-20.50; 12 foundry alloy (No. 2 grade) 19.25- 5; 5% silicon alloy, 0.60 Cu max., 20.00- 9; .13 alloy, 0.60 Cu max., 22.25-23.25; alloy 21.00-21.50; 108 alloy 19.50-20.50; deoxidizing grades, notch bars, granu- or shot: Grade 1, 20.00-20.50; grade 2, 0-19.00; grade 3, 17.75-18.25; grade 4, 0-17.50.

s Ingot: Red brass, No. 115, 27.00; tin e No. 225, 39.00; No. 245, 33.25; high- ed tin bronze, No. 305, 31.50; No. 1 ow, No. 405, 23.25; manganese bronze No. 26.75.

nesium Alloy Ingot: AZ63A, 31.50; AZ91B, 0; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

e, soft, f.o.b. eastern mills, 100,000 lb lots, 6; 30,000 lb lots, 35.48; l.c.l. 35.98. Weath- roof, 100,000 lb, 36.28; 30,000 lb, 36.53; 37.03. Magnet wire del., 15,000 lb or e 41.83; l.c.l. 42.58.

LEAD

ices to jobbers f.o.b. Buffalo, Cleveland, tsburgh.) Sheets, full rolls, 140 sq ft or re $19.00 per cwt; pipe, full coils $19.00 cwt; traps and bends, list prices plus 30%.

TITANIUM

ices per lb, 10,000 lb and over, f.o.b. mill) eets, $15; sheared mill plate, $12; strip, $15; e, $11; forging billets, $6; hot-rolled and ged bars, $6.

ZINC

eets 23.00, f.o.b. mill, 36,000 lb and over. bon zinc in coils, 19.50-20.50, f.o.b. mill, 000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

te $27; H.R. strip $28; C.R. strip $35; ged or H.R. bars $27; wire, 0.015 in., 1 t per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
eet, C.R. ...	86.5	67.5	92.5
rip, C.R. ...	92.5	70.5	98.5
ate, H.R. ...	84.5	66.5	90.5
d, Shapes ..	82.5	65.5	88.5
amless Tubes	115.5	100.5	137.5
ot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	—Round— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares. Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
pper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
llow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
ed Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
w Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
val Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
ommercial Bronze, 90% ..	46.95	46.89	47.49	49.51	23.875	23.625	23.125
ickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
hosphor Bronze, A, 5% ..	66.58	67.08	67.08	68.23	26.125	25.875	24.875
ilicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
anganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
untz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. . Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping oint. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clippings 13.00; mixed clippings 11.00; old sheet 10.00; borings and turnings 6.50; pistons and struts 7.50; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 copper 23.00-23.50; light copper 21.00-21.50; No. 1 composition red brass 18.50-19.00; No. 1 composition turnings 17.75-18.25; mixed brass turnings 13.00; new brass clippings 18.00; No. 1 brass rod turnings 13.75-14.25; light brass 12.00; heavy yellow brass 13.75-14.25; new brass rod ends 15.25; auto radiators, unsweated 15.00; cocks and faucets 16.00-16.50; brass pipe 17.00.

Lead: Heavy 10.75-11.25; battery plate 5.75-6.25; linotype and stereotype 13.00; electrotype 11.25; mixed babbitt 12.75.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 45.00-50.00.

Zinc: Old zinc, 4.75; new die cast scrap, 4.25; old die cast scrap, 2.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 14.50-15.00; 51S, 52S clippings 14.50-15.00; 14S, 17S, 24S clippings 13.00-13.50; mixed clippings 12.50-13.50; old sheet 11.50-12.50; old cast 11.50-12.50; clean old cable, free of steel 14.50-15.00; borings and turnings 12.00-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; refinery brass (60% copper) per dry copper content 22.50; auto radiators, 17.00-17.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; No. 1 composition borings 20.50; No. 1 composition solids 21.50; heavy yellow brass solids 16.50; yellow brass turnings 16.00; radiators 17.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.125; 200-499 lb $1.11; 500-999 lb $1.105; 1000 lb or more $1.10.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71.5; 100-600 lb 57.2; 700-1900 lb 54.7; 2000-9900 lb 53; 10,000 lb or more 51.9.

Stannous Chloride (Anhydrous): Less than 50 lb $1.576; 50 lb $1.236; 100-300 lb $1.086; 400-900 lb $1.061; 1000-1900 lb $1.037; 200-4900 lb $1; 5000-19,000 lb 93.9; 20,000 lb and over 87.8.

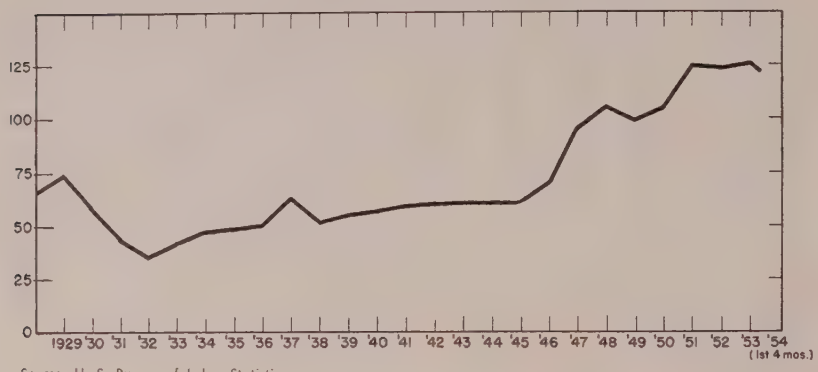
Stannous Sulphate: Less than 50 lb $1.275; 50 lb 97.5; 100-1900 lb 95.5; 2000 lb and over 93.5.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

A Long Look at Nonferrous Metals Prices

(Average Wholesale Price Index: 1947-1949=100)



Source: U. S. Bureau of Labor Statistics

STEEL will offer broadened perspective on nonferrous metals prices through use of sensitive, weighted index computed by U. S. Bureau of Labor Statistics

A NEW perspective on prices is being added to STEEL's weekly coverage of nonferrous metals, in the form of a sensitive, weighted price index.

Covering the entire range of commercially important nonferrous metals, the index appears in this space for the first time this week. It will be published once a month in chart, table or text form, supplementing STEEL's monthly price averages for copper, lead, zinc, tin, aluminum, magnesium and nickel.

Coverage—Representing nonferrous metals as a single group for study of over-all trends, the index can be broken into its components for reports on active products or groups. Five classes of nonferrous metals are covered: Primary metal refinery shapes, scrap, secondary metal and alloy basic shapes, mill shapes, and wire and cable.

These five classes encompass 48 commodities whose prices are computed monthly by the Bureau of Labor Statistics, U. S. Department of Labor, Washington. Index figures are specially supplied to STEEL after compilation of data.

Postwar Base—Here's how the index is explained by Jesse M. Cutts, chief of the BLS Branch of Industrial Prices: A 1947-1949 base period is used; monthly index levels are relative to that period. Base value weights are assigned each product comprising the index according to that product's annual value of shipments.

Under the present system, values not only represent the commodity directly priced but include the value of other items whose prices move similarly. For example, common pig lead is directly priced for the index. To the domestic shipment value of pig lead the bureau adds the value of lead pipe, sheets and other lead products to reach an adjusted base value weight. In this manner the index attempts to cover the entire nonferrous "universe."

Reweighted — While the present BLS Index is perhaps the truest yet devised to cover the complex metals field, it's undergoing further refinement to maintain an up-to-date basic weight structure. The bureau hopes to present a completely reweighted nonferrous metals index in January, 1955, with base value weights assigned each product according to the value of shipments in 1952-53. Under the new system all components of the index will be directly priced rather than adjusted to a key commodity.

Following are products presently assigned weightings in the nonferrous index, with percentage values of each class shown in parentheses.

Primary metal refinery shapes class (18.9 per cent) includes virgin aluminum ingot, electrolytic copper, lead, nickel cathode sheets, silver bar, pig tin, slab zinc, antimony, cadmium stick and bar, mercury.

Scrap class (12.0 per cent) includes aluminum clippings, No. 1 copper wire, heavy yellow brass solids, No. 1 composition solids, lead battery plates, nickel anodes, block tin, die cast scrap and antimony.

Secondary metal and alloy basic shapes class (9.3 per cent) includes aluminum ingot, red brass ingot, babbitt metal, 50/50 solder, copper, lead, nickel, tin, zinc and antimony.

Mill shapes class (37.8 per cent) includes aluminum sheet and rod, cartridge brass sheet, yellow brass rod and tube, copper water tube and round tubing, copper sheet, sheet lead, tin collapsible tubes and zinc strip.

Wire and cable class (22.0 per cent) includes bare copper wire, building wire, nonmetallic sheathed cable, varnished cambric cable, flexible cord, automotive primary wire, automotive ignition cable and automotive battery cable.

Mirror—Accurately reflecting nonferrous business conditions, the price index started 1954 below 1953 levels. In February it sank to its lowest point since October, 1950, but recovered strongly in March and April. Further improvement is promised in May. In the chart, 1954 is shown as an average of the first four months.

STEEL's Metal Price Averages for May, 1954

(Cents per pound)

Electrolytic Copper, del. Conn.	30.000
Lead, St. Louis	13.800
Prime Western Zinc, E. St. Louis	10.290
Straits Tin, New York	93.600
Primary Aluminum Ingots, del.	21.500
Magnesium, Freeport, Tex.	27.00
Nickel, f.o.b. refinery	60.000

Tin Riddle

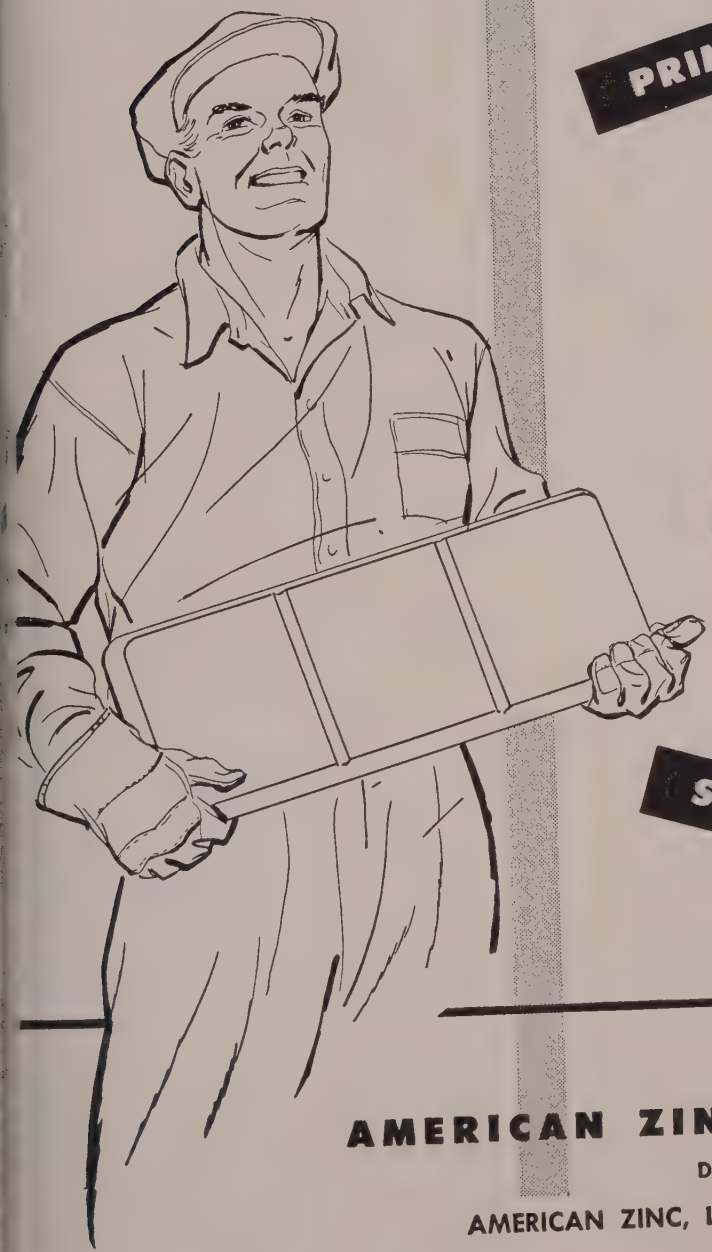
Riddle in tin: Why did the Senate Armed Services Committee back the bill to keep the government tin smelter operating? The bill passed the Senate last week by voice vote in what many observers believe to be a case of government charity toward Texas politicos and countries supplying the smelter its ore. According to the government's own estimate, there's enough tin on hand now for at least six years of war.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC



PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 167. Key to footnotes, page 169.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 .....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 .....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..80.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2..75.50
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....75.50
Seattle B3 .....89.00
So.Chicago R2,U5,W14.75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2, U5,W14.82.00
So.Duquesne,Pa. U5 ..82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa.J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.885
Kokomo,Ind. C16 .....4.625
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen, Pa. P7 ....4.525
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ..5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ...4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5,W14.4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.10

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.15
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 ....5.00

H.S., L. A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 ....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5,W14.6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L. A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

PILING

Bearing Piles
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky.(15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 ....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.10
Conshohocken,Pa. A3 ..4.10
Ecorse,Mich. G5 .....4.25
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 .4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
LoneStar,Tex. L6 .....4.40
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.40
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ...6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ...5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland l.c.l.(15) A10..4.85
Cleveland c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.35
Bessemer,Ala. T2 .....4.15
Birmingham,Ala. C15. ..4.15
Buffalo(31) R2 .....4.18
Chicago(31) R2 .....4.22
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity, Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14, P23....4.90
So.Chicago U5, W14 ....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 .....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

Bars, Hot-Rolled Alloy
BethlehemPa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.025
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 .....5.925
Gary, Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2,Y1.4.875
Johnstown,Pa. B2 .....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2,U5,W14.4.875
So.Duquesne,Pa. U5 ...4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala. T2 ....6.225
Bethlehem,Pa. B2 ....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.375
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 ....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ...6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12....5.20
BeaverFalls,Pa. R2 ....5.26
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.27
GreenBay, Wis. F7 ....5.20
Hammond,Ind. L2, M13.5.20
Hartford,Conn. R2 .....5.70
Harvey,Ill. B5 .....5.20
LosAngeles R2 ....6.65-6.96
LosAngeles S30 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R8 .....5.20
Massillon,O. R2 .....5.24
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 ....5.65
NewCastle,Pa.(17) B4 ..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy
(Turned and Ground)
Cumberland,Md.(5) C19.4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 ....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie, Pa. C12 ....6.3
Chicago W18 .....6.3
Cleveland A7, C20 ....6.3
Detroit R7 .....6.4
Detroit P17 .....6.4
Detroit B5 .....6.5
Donora,Pa. A7 .....6.3
Elyria,O. W8 .....6.3
Gary,Ind. R2 .....6.3
Hammond,Ind. L2,M13.6.3
Hartford,Conn. R2 ....6.7
Harvey,Ill. B5 .....6.3
Lackawanna,N.Y. B2 ..6.3
Mansfield,Mass. B5 ....6.7
Massillon,O. R2, R8 ..6.3
Midland,Pa. C18 .....6.3
Monaca,Pa. S17 .....6.3
Newark,N.J. W18 .....6.
Plymouth,Mich. P5 ....6.5
So.Chicago,Ill. R2,W14.6.3
SpringCity,Pa. K3 .....6.
Struthers,O. Y1 .....6.3
Warren,O. C17 .....6.3
Waukegan,Ill. A7 ....6.3
Worcester,Mass. A7 ...6.6
Youngstown F3, Y1 ...6.3

BARS, Reinforcing (fabricators
AlabamaCity,Ala. R2 ...4.
Atlanta A11 .....4.
Birmingham,Ala. C15 ..4.
Buffalo R2 .....4.
Cleveland R2 .....4.
Emeryville,Calif. J7 ....4.9
Fairfield,Ala. T2 .....4.
Fairless,Pa. U5 .....4.
Fontana,Calif. K1 .....4.8
Gary,Ind. U5 .....4.1
Houston S5 .....4.5
Ind.Harbor,Ind. I-2, Y1.4.1
Johnstown,Pa. B2 .....4.1
KansasCity,Mo. S5 ....4.7
Lackawanna,N.Y. B2 ..4.1
LosAngeles B3 .....4.8
Milton,Pa. M18 .....4.1
Minnequa,Colo. C10 ....4.7
Niles,Calif. P1 .....4.8
Pittsburg,Calif. C11 ....4.8
Pittsburgh J5 .....4.1
SandSprings,Okla. S5 ..5.0
Seattle B3, N14, P23...4.9
So.Chicago,Ill. R2 .....4.1
So. Duquesne,Pa. U5 ...4.1
So.SanFrancisco B3 ....4.9
SparrowsPoint,Md. B2 ..4.1
Sterling,Ill.(1) N15 ....4.1
Struthers,O. Y1 .....4.1
Torrance,Calif. C11 ....4.8
Youngstown R2,U5 ....4.1

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.5
KansasCity S5 .....6.3
LosAngeles B3 .....5.8
Marion,O. P11 .....5.5
Seattle N14 .....5.8
Seattle B3, P23 .....5.8
So.SanFrancisco B3 ...5.8
SparrowsPt. ½-1" B2 ..5.5
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(3) J5 .....4.25
ChicagoHts.(3) C2, I-2..4.05
ChicagoHts.(4) C2, I-2..4.15
Ft.Worth,Tex.(26) T4 ..4.65
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 ....4.15
Williamsport,Pa.(3) S19.4.25
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

SHEETS

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..3.975
Detroit M1 .....4.075
Ecorse,Mich. G5 .....4.075
Fairfield,Ala. T2 .....3.925
FairlessPa. U5 .....3.975
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925

omo,Ind. C16 ....4.025
awanna,N.Y. B2 .3.925
nail,Pa. U5 .....3.925
ort,Ky. N9 .....3.925
.O. N12 .....5.175
burg,Calif. C11 ...4.625
burgh J5 .....3.925
smouth,O. P12 ....3.925
rdale,Ill. A1 .....3.925
on,Pa. S3 .....3.925
hicago,Ill. W14 ..3.925
rowsPoint,Md. B2.3.925
benville,O. W10 ..3.925
rance,Calif. C11 ...4.625
ren,O. R2 .....3.925
rton,W.Va. W6 ...3.925
ngstown U5, Y1 ...3.925

ETS H.R. (19 gage)
bamaCity,Ala. R2 .5.225
er,O. R1 .....5.05
omo,Ind. C16 ....5.025
nsfield,O. E6 .....5.05
es,O. N12 .....4.775
rance,Calif. C11 ....5.875

ETS, H.R. (14 ga. heavier)
igh-Strength Low-Alloy
veland J5, R2 .....5.90
shohocken,Pa. A3 ..5.90
rse,Mich. G5 .....6.05
rfield,Ala. T2 .....5.90
rless,Pa. U5 .....5.95
tana,Calif. K1 ....6.675
ry,Ind. U5 .....5.90
l.Harbor,Ind. I-2 ....5.90
l.Harbor,Ind. Y1 ....6.40
in,Pa. U5 .....5.90
ckawanna(35) B2 ...5.90
nhall,Pa. U5 .....5.90
tsburgh J5 .....5.90
aron,Pa. S3 .....5.90
Chicago,Ill. U5 .....5.90
arrowsPoint (36) B2..5.90
arren,O. R2 .....5.90
irton,W.Va. W6 .....5.90
ungstown U5 .....5.90
ungstown Y1 .....6.40

EETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
shland,Ky.(8) A10 ..4.175
eveland R2 .....4.525
d.Harbor,Ind. I-2 ..4.175
arren,O. R2 .....4.525

EETS, Cold-Rolled Steel (Commercial Quality)
llenport,Pa. P7 .....4.775
leveland J5, R2 .....4.775
corse,Mich. G5 .....4.925
airfield,Ala. T2 .....4.775
airless,Pa. U5 .....4.825
ollansbee,W.Va. F4 ..4.775
ontana,Calif. K1 ....5.875
ary,Ind. U5 .....4.775
anite City,Ill. G4 ....4.975
nd.Harbor,Ind. I-2, Y1 4.775
rvin,Pa. U5 .....4.775
ackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.375
Fairless,Pa. U5 .....7.275
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.075	6.675
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O. W10	6.075	....
Pitts.,Calif. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ..5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 .....5.275
Gary,Ind. U5 .....5.275
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275
Kokomo,Ind. C18 .....5.375
MartinsFerry,O. W10...5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ...6.025
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.275
Weirton,W.Va. W6 ....5.275

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky. (8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825
Kokomo,Ind. C16 .....5.925
Niles,O. N12 .....5.825

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 .....5.275
Middletown,O. A10 ....5.275

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ...7.20
Follansbee(23) F4 .....6.425
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 ....3.925
Birmingham C15 .....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.075
Ecorse,Mich. G5 .....4.075
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5 .4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ...4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ..4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3, P23 ..4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2..3.925
Torrance,Calif. C11 ....4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3, P23 ..6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. C5 .....5.45
Baltimore T6 .....5.60
Bridgeport,Conn.(10)S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.60
Detroit M1 .....5.60
Detroit D2, P20 .....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.60
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ....5.70
Ind.Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ...5.45
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(32) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 ....5.45
Warren,O. B9, R2 ....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) NS.12.15
Pawtucket,R.I.(12) NS.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ..12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.30
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G8 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke,Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg.Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.60	7.95	8.90	10.85	13.15
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland,O. C7	...	8.00	8.60	10.55	12.85
Dearborn,Mich. D3	5.60	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.80	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Indianapolis C8	...	7.80	8.60	10.55	....
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15.	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.90	10.85	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I.(12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	....
Buffalo W12	...	...	12.50	....	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	....	8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	....
Zanesville,O. A10	....	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05‡	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS

(22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	....	....	....	....	12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill.(1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Milbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Portsmouth,O. D2	9.50
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen.Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Baltimore T6	7.75
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo. S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
MonessenP7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O. P12	6.675 ....
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48) C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Sterl'g(1)(48) N15	6.675 7.20
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City, 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga.	J5 143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga., 6" B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	..
SparrowsPoint,Md. B2	..
Sterling,Ill.(1) N15	....

WIRE, Barbed	
AlabamaCity R2	15
Aliquippa J5	1
Atlanta A11	..
Bartonville,Ill. K4	..
Crawfordsville,Ind. M8	..
Donora,Pa. A7	1
Duluth,Minn. A7	1
Fairfield,Ala. T2	1
Houston,Tex. S5	..
Johnstown,Pa. B2	1
Joliet,Ill. A7	1
KansasCity,Mo. S5	..
Kokomo,Ind. C16	1
Minnequa,Colo. C10	1
Monessen,Pa. P7	..
Pittsburg,Calif. C11	1
Rankin,Pa. A7	1
So.Chicago,Ill. R2	15
S.SanFrancisco C10	1
SparrowsPoint,Md. B2	..
Sterling,Ill. (1) N15	..

WIRE (16 gage)	An'ld. Ga Stone Ste
Ala.City R2	12.50 14.0
Aliquippa J5	12.50 14.3
Bartonville K4	12.60 14.
Buffalo W12	12.50 ..
Cleveland A7	12.50 ..
CrawfordsvilleM8	12.50 14.
Fostoria,O. S1	12.60 14.
Johnstown B2	12.50 14.3
Kokomo C16	12.60 14.1
Minnequa C10	12.75 14.45
Palmer,Mas.W12	12.50 14.0
Pitts.,Calif. C11	12.85 14.4
SparrowsPt. B2	12.60 14.4
Sterling(1) N15	12.50 14.
Waukegan A7	12.50 14.0
Worcester A7	12.80 ..

* Based on 11c zinc; * zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Co
AlabamaCity,Ala. R2	13
Aliquippa,Pa. J5	13
Atlanta A11	13
Bartonville,Ill. K4	13
Chicago,Ill. W13	13
Cleveland A9	13
Crawfordsville,Ind. M8	13
Donora,Pa. A7	13
Duluth,Minn. A7	13
Fairfield,Ala. T2	13
Galveston,Tex. D7	13
Houston,Tex. S5	13
Johnstown,Pa. B2	13
Joliet,Ill. A7	13
KansasCity,Mo. S5	14
Kokomo,Ind. C16	13
Minnequa,Colo. C10	13
Monessen,Pa. P7	13
Pittsburg,Calif. C11	15
Rankin,Pa. A7	13
So.Chicago,Ill. R2	13
SparrowsPt.,Md. B2	13
Sterling,Ill. (1) N15	13
Worcester,Mass. A7	13

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.0
Wheeling,W.Va. W10	8.0

STAPLES, Polished Stock To dealers & mfrs. (7)	Col
AlabamaCity,Ala. R2	13
Aliquippa,Pa. J5	13
Atlanta A11	13
Bartonville,Ill. K4	13
Crawfordsville,Ind. M8	13
Donora,Pa. A7	13
Duluth,Minn. A7	13
Fairfield,Ala. T2	13
Johnstown,Pa. B2	13
Joliet,Ill. A7	13
Kokomo,Ind. C16	13
Minnequa,Colo. C10	13
Monessen,Pa. P7	13
Pittsburg,Calif. C11	15
Rankin,Pa. A7	13
So.Chicago,Ill. R2	13
SparrowsPt.,Md. B2	13
Sterling,Ill. (1) N15	13
Worcester,Mass. A7	13

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2 I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	148

AMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

—Inches	2		2½		3		3½		4		5		6	
Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
nds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
quippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
bridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	....
ain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
ngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

ngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

TTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

e -Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
t Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
nds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
quippa, Pa. J5 (‡)	...	...	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
on, Ill. L1 (§)	...	...	....	....	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
nwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
tler, Pa. F6	26.5	—1.75	19.5	+2.75	12.5	+6.25	....	..	....	..	....	....	....	....	....	....
na, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
irless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
ntana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
l. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
rain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
aron, Pa. S4 (‡)	26.5	list	19.50	+4.00	12.5	+9	....	..	....	..	....	....	....	....	....	....
aron, Pa. M6	...	...	....	....	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
arrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
oungstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
oungstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.75	14	31.75	17.5	34.25	18.5	34.75	19.5
heatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.75	14	31.75	17.5	34.25	18.5	34.75	19.5

ze—Inches	2		2½		3		3½		4	
st Per Ft	37c		58.5c		76.5c		92c		$1.09	
ounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
quippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
ton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
nwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
na, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
irless, Pa. N3	33.25	....	34.75	....	34.75	...	25.75	....	25.75	....
ntana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
d. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
rain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
aron, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
arrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
oungstown R2 (**)	35.25	21.5	36.75	21	36.75	21	27.75	11.5	27.75	11.5
oungstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
heatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

OILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
.....	13	....	19.02	18.44
¼	13	....	22.53	18.12
⅜	13	20.65	24.91	20.01
½	13	24.40	29.43	23.66
.....	13	27.34	32.98	26.51
¼	13	30.80	37.15	29.86
1¼	12	33.43	40.32	32.41
1½	12	36.82	44.41	35.70
1¾	12	39.87	48.09	38.66
2	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary, Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.225	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

Cleveland R2	11.00
KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00
Seattle,Wash. B3	11.50

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.05
Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
7/16-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	4
⅝-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.: All diameters.	+4
Lag bolts, all diams.: 6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. and C.P., regular & heavy: Square, all sizes 58

H.P., Hex, regular & heavy:

¾" and smaller	58
⅞" to 1⅛", inclusive	60
1¼" to 1½", inclusive	62
1⅝" and larger	58

C.P. Hex regular & heavy: All sizes 58

Hot Galv. Nuts (all types):

¾" and smaller	40
⅞" to 1½", inclusive	43

Finished Hex Nuts: New standard, all sizes 58

Semifinished & Slotted Hex: Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish ..... 47.5 x 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.: ⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge Iron: Cents
98+% Fe, annealed. 18.00
Unannealed
Minus 100 mesh 14.50
Minus 35 mesh 10.50
Minus 20 mesh 10.00
Swedish, c.i.f. N. Y., c.l., in bags 11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags.... 11.25
Electrolytic iron:
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in. 23.00
Annealed, 99.5% Fe. 42.50
Unannealed (99+% Fe) 36.50
Unannealed (99+% Fe) (minus 325 mesh) 53.50
Powder Flakes (minus 16, plus 100 mesh).. 31.00
Carbonyl Iron:
97.9-99.8% size 5 to 10 microns..83.00-148.00
Aluminum:
Atomized, 500 lb drums, frgt. allowed:
Carlots 31.00
Ton lots 34.00
Antimony, 500 lb lots 32.00*
Brass, ¼-ton lots .....28.75-37.50†
Bronze, ¼-ton lots .....50.00-60.00‡
Copper:
Electrolytic 13.50*
Reduced 13.50*
Lead 7.50*
Magnesium 54.00-56.00
Manganese:
Minus 35 mesh 61.00
Minus 100 mesh 67.00
Minus 200 mesh 72.00
Nickel, unannealed 89.50
Nickel-Silver, ¼-ton lots .....44.00-49.00§
Nickel-Silver, ¼-ton lots 46.75**
Phosphor-Bronze, ¼-ton lots 58.50
Silicon 43.50
Solder 8.50*
Stainless Steel, 302 ... 91.00
Tin 14.50*
Zinc, ¼-ton lots.15.00-28.75‡
Tungsten Dollars
Melting grade, 99% 60 to 200 mesh:
1000 lb and over.... 4.95
Less than 1000 lb .. 5.10
Chromium electrolytic 99.9% Cr min. 3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9 10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	38.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	49.00	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.50	59.00	62.75	62.75
316L	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Bar Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold Rolled 10%	Cold Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Side
Copper*	27.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22 Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7 Copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.38
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	3.875
18.25	4.25	1	4.75	...	2.160-2.320
18	4	2	9	...	2.515
18	4	2	....	...	1.640
18	4	1	....	...	1.480
13.5	4	3	....	...	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON

Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Neville Island,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.75	61.25	61.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; and $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

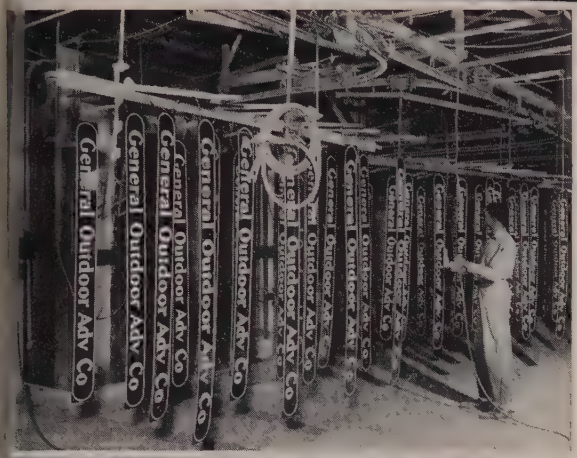
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

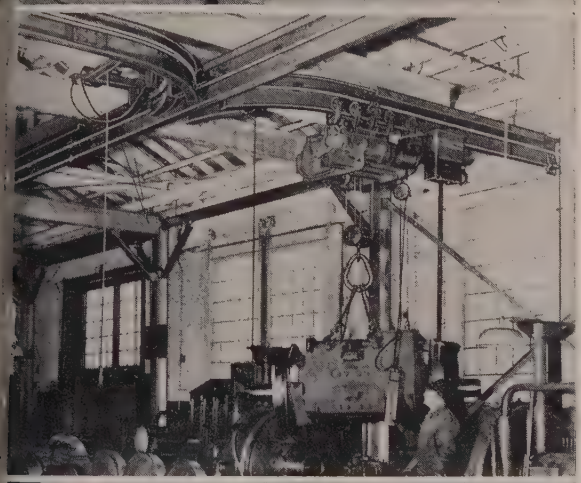
Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	64.00
Troy,N.Y. R2	64.00

what MONORAIL can do . . .



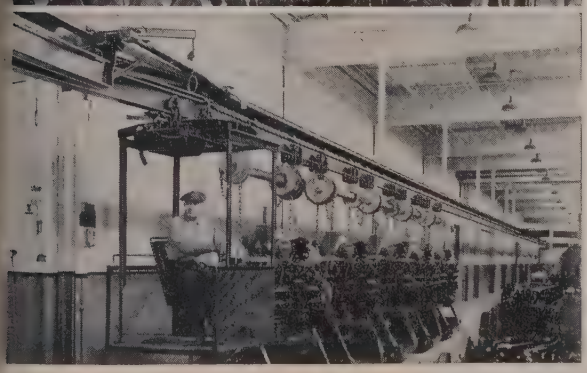
WHERE SPACE IS LIMITED

MonoRail relieves operating congestion by transferring materials handling to unused overhead area. Equipment can often be installed with no loss of production.



TO MOVE VARIABLE LOADS

Any size or shape of load, within the capacity of a MonoRail system, can be moved by using slings, grabs or other quickly changed "below the hook" devices for hand or electric operation.



FOR LOW MAINTENANCE COSTS

American MonoRail equipment is specially engineered and carefully built for long-life, rugged service. Manual or automatic operation continues with little or no downtime for maintenance or repair.

Send for Bulletin C-1 illustrating hundreds of successful MonoRail installations.

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 3 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.12	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.18	7.15	8.70	6.79	...	6.35	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	...	6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.30	7.11	8.20	6.66	...	6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.18	7.12	8.25	6.58	...	6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.38	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.15	...	8.25	6.45	...	6.28	7.25[4]	....	6.46	6.33	7.46
Houston	7.15	7.60	9.23	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles	7.25	8.60	8.85	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59	...	6.45	7.57	11.77	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.30	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.78	7.52	8.37	7.16	...	7.06	8.43[6]	11.99	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.00	...	7.00	8.50	....	7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.19[6]	11.74	6.67	6.63	7.66**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg.	7.60	8.45	9.05	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	...	8.67	7.10	...	7.05	8.20	....	7.10	6.85	8.20
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.84	7.78	8.61	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	8.95	7.60	...	7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.10	7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **⅛-in. and heavier, add 0.34c for 12 gage and lighter. ††as annealed Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 99 lb; [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Warehouse Steel Price Tone Weakens

Distributors report softness in New York, Cincinnati and Pittsburgh in certain products. Competition is keen for numerous small orders

Cleveland—The holiday curtailment in industry served to cut down demand for steel from warehouses in this district during the closing days of May. Distributors, however, say volume for the month stacked up pretty well with that of April and they are of the opinion June volume will show some improvement, especially should it become evident as the month progresses that a steel strike is likely. The warehouses are in excellent position to care for customers' needs.

New York—Warehouses are getting a substantial number of orders, but they are small. Demand is well spread as to products, but this type of volume is costly.

Inventories are gradually being worked down and volume placed with mills is slightly higher. Distributors are not buying beyond replacement requirements and generally will operate on a lower inventory base. Fabricating operations, flame cutting, shearing to size and like shop operations are well below normal.

Merchant steel pipe prices are soft.

Philadelphia—Most warehouses look for no improvement in June business. In fact, they wouldn't be surprised if an easing off toward the end would bring the month's total down from May.

Cincinnati—Listing of excess tonnage by marginal warehouse operators is contributing to price weakness in the flat-rolled items and structurals. Even so, it appears May was a better month than April for the distributors, most of whom are in an optimistic frame of mind.

Pittsburgh—Generally, sales continue to improve over the early second quarter, but this is not typical of all warehouses or all products. In sheet and strip, price weakness continues. Some distributors report a gain in inquiries for the products while others admit sales are sporadic.

Distributors say the number of or

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.55	$4.55	$4.50	$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot-Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

s is up between 10 and 20 per cent n last year, while the size of the ividual order remains low.

hicago—Steel warehouses anticie buying will continue through e at a level fairly close to May ume. Beyond that is somewhat of question mark because vacation sings of many industrial plants for ying periods will restrict consumpn of steel.

San Francisco — High optimism vades the local warehouse trade.

Los Angeles—Mill deliveries are ickening, averaging less than 30 ys in most cases.

heets, Strip . . .

Sheet and Strip Prices, Page 166 & 167

Boston—Cold-rolled carbon sheet eliveries are slightly more extended. ractically no tonnage is open for me with bookings 10 to 15 per nt heavier than May. Galvanized also more active, shipments now omised for August. Upturn in spealties and alloys is less pronounced ith stainless available in three eeks, sometimes before.

Spread between 301 and 302 stainss grades is wider, the former beag nearly $40 per ton lower. This s switching some volume to 301 here work-hardening and drawing s not too severe.

New York — Little buoyancy is oted in sheets, except for galvanized nd certain specialties. Trading in ot and cold-rolled sheets is a shade ivelier than a month or so ago, but ecently has shown little change.

Philadelphia—Activity in galvaized sheets and specialties is conributing principally to better volume n light, flat-rolled products.

Pittsburgh—Reported stocking of cold-rolled sheet by automakers doesn't affect this area, where consumers continue to purchase only for actual modest requirements.

Strip sales are 10 per cent ahead of last month.

Cleveland—Something of a slight quickening in demand for the light flat-rolled products is noted by mills in this area. The bulge in demand is not large, but it is considered significant in the light of the sluggishness of buying over recent past weeks. Both hot-rolled and cold-rolled sheets are being sought in larger volume, though buying still is pretty much for prompt shipment. Galvanized sheets continue quite active as has been the case for some weeks.

Chicago — Industrial Machine & Tool Corp., Tulsa, Okla., is low on two contracts for 157,433 steel drums, 55-gal., two contracts, one for 100,000, bid to Army Quartermaster, Chicago.

Heavy Structural Steel Tonnage Moved

April shipments were second highest for any one month in 25 years reflecting improved availability. Contracts still show modest decline. Competition among fabricators keen

Structural Shape Prices, Page 166

New York—While structural contracts show further modest decline, shipments of 290,353 tons in April were the second highest in 25 years, according to the American Institute of Steel Construction. They were topped by 295,459 tons in October, 1953, and by 323,785 tons in October, 1929.

Sharp competition among fabricators on a delivery as well as price basis, and ability of shops to make better shipments now that plain material is available may account principally for the high level of tonnage moved for April, some trade interests believe. Exceptions to quick availability of steel are some sizes of wide flange but even this has not caused too many complications over recent weeks.

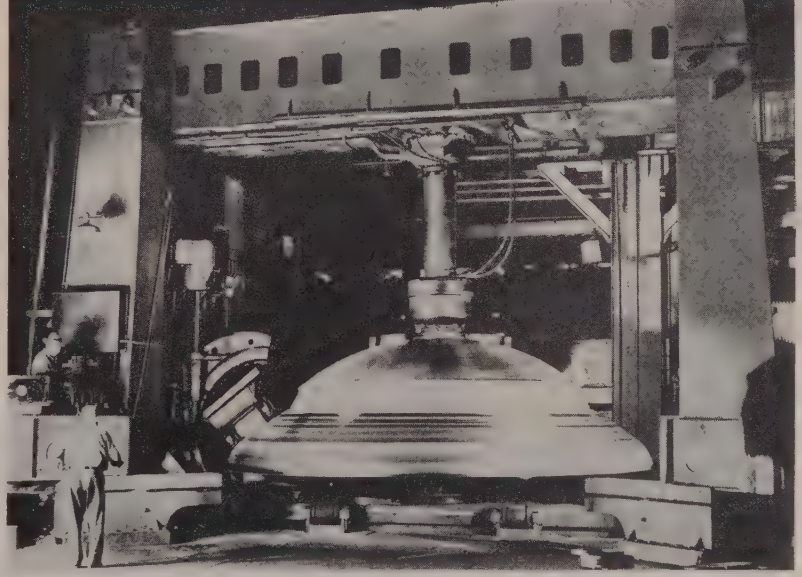
Another, but not too important factor, may have to do with closed contracts, with shipments some times not reported until all have been completed. This means occasionally the skipping of reports of movements for two or three months—although it averages up before too long.

April structural contracts amounted to 182,859 tons, compared with 306,052 tons in the corresponding period of last year and 193,509 tons in March. Total bookings for the first four months were 820,722 tons, against 1,012,360 tons in the same period of 1953. Backlogs as of Apr. 30 stand at 1,566,214 tons, compared with 2,167,758 tons the year previously.

Total shipments for the first four months of this year amounted to 1,074,466 tons, against 1,022,077 in the same period last year.

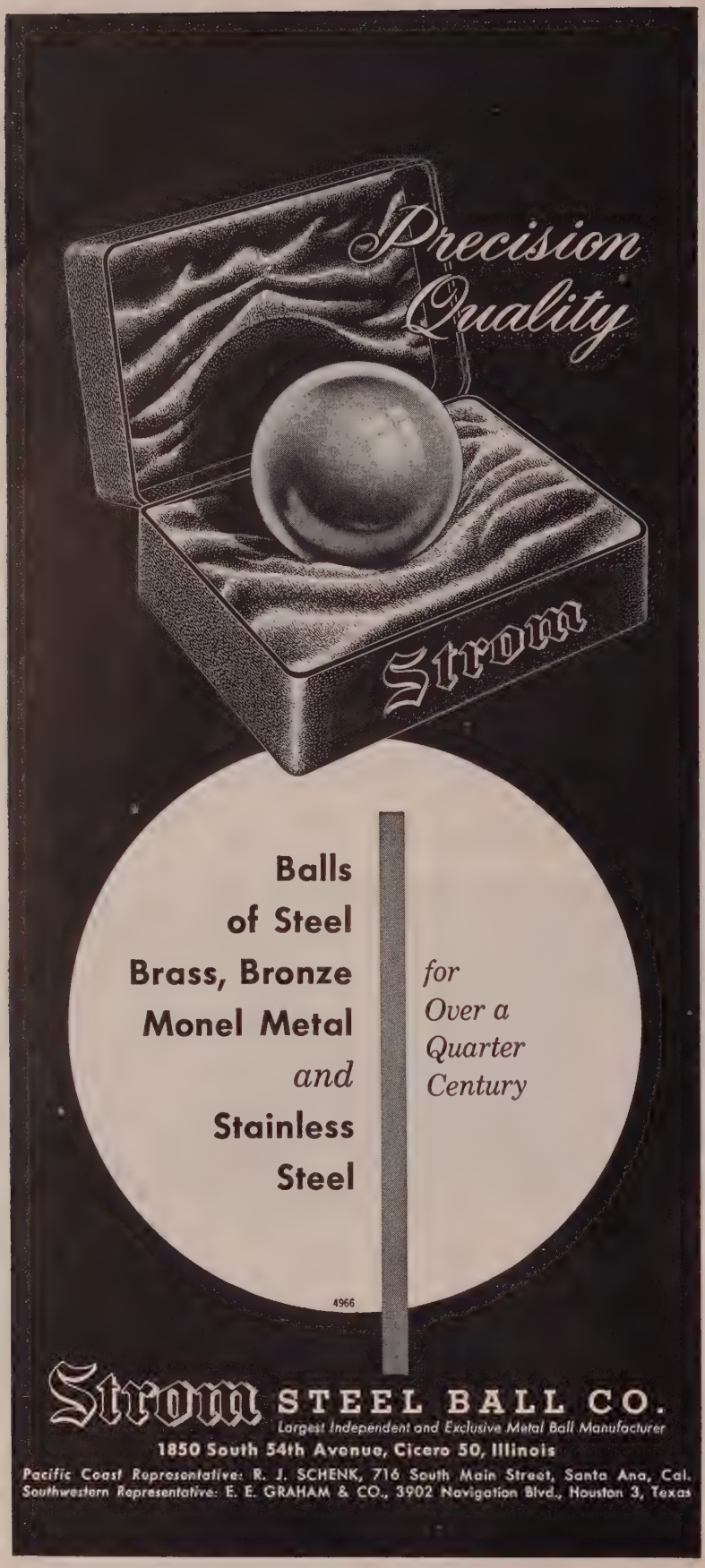
Although competition among fabricators remains keen, a moderately good amount of structural work is active. The largest award in the local area involves 2100 tons for a power plant at Island Park, N. Y.

Boston—All contracts let for erection of structural steel, 87 bridges, Maine turnpike extension, including Androscoggin river span, 1740 tons,



Lukens Spins Heads Weighing Over 18 Tons Apiece

Elliptical flanged and dished heads of ASTM A-212-B firebox steel have been added to Lukens Steel Co.'s list of stock heads. Above, a flanged, dished and flued head 20 ft 4-7/32 in. outside diameter is being spun by a worker experienced in the specialized art of steel sculpture. Lukens makes spun heads in one piece from 12 in. to over 21 ft 8 in. and pressed heads from 4 in. to 10 ft in diameter. Heads up to 6½ in. thick can be produced by both methods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have been for bolted connections in competition with riveting, although prices per ton vary considerably. For the river bridge, bolted erection cost is $70 per ton while for smaller bridge groups, one taking 720 tons cost is $40 per ton.

Substantial volume of fabricated structural steel is being estimated. Bridges lead and will increase in second half, but military and private industrial inquiry holds up well. Equalization on bar shapes is broadening.

Philadelphia — Structural steel business is moderately active and possibly a shade more diversified.

Pittsburgh—Construction companies are not yet certain that structural shape supply difficulties have been adjusted satisfactorily. Reductions in mill operations tend to delay delivery of shapes, disturbing construction schedules.

Stainless Steel . . .

Stainless Steel Prices, Page 170

Beaver Falls, Pa.—Babcock & Wilcox Co.'s tubular products division announces completion of an expansion program which will increase by nearly 40 per cent productive capacity for stainless steel tubular products here.

Company officials say that advancements in atomic energy, aircraft and boiler industries have increased need for stainless tubing of standard grades and have established need for special grades.

Plates . . .

Plate Prices, Page 166

Boston—Tank shops are the most active plate fabricators, but they are buying little beyond specific requirements. Many plate users are operating with inventory lower than normal. So close are some on supply, any delay in promised shipments is cause for concern.

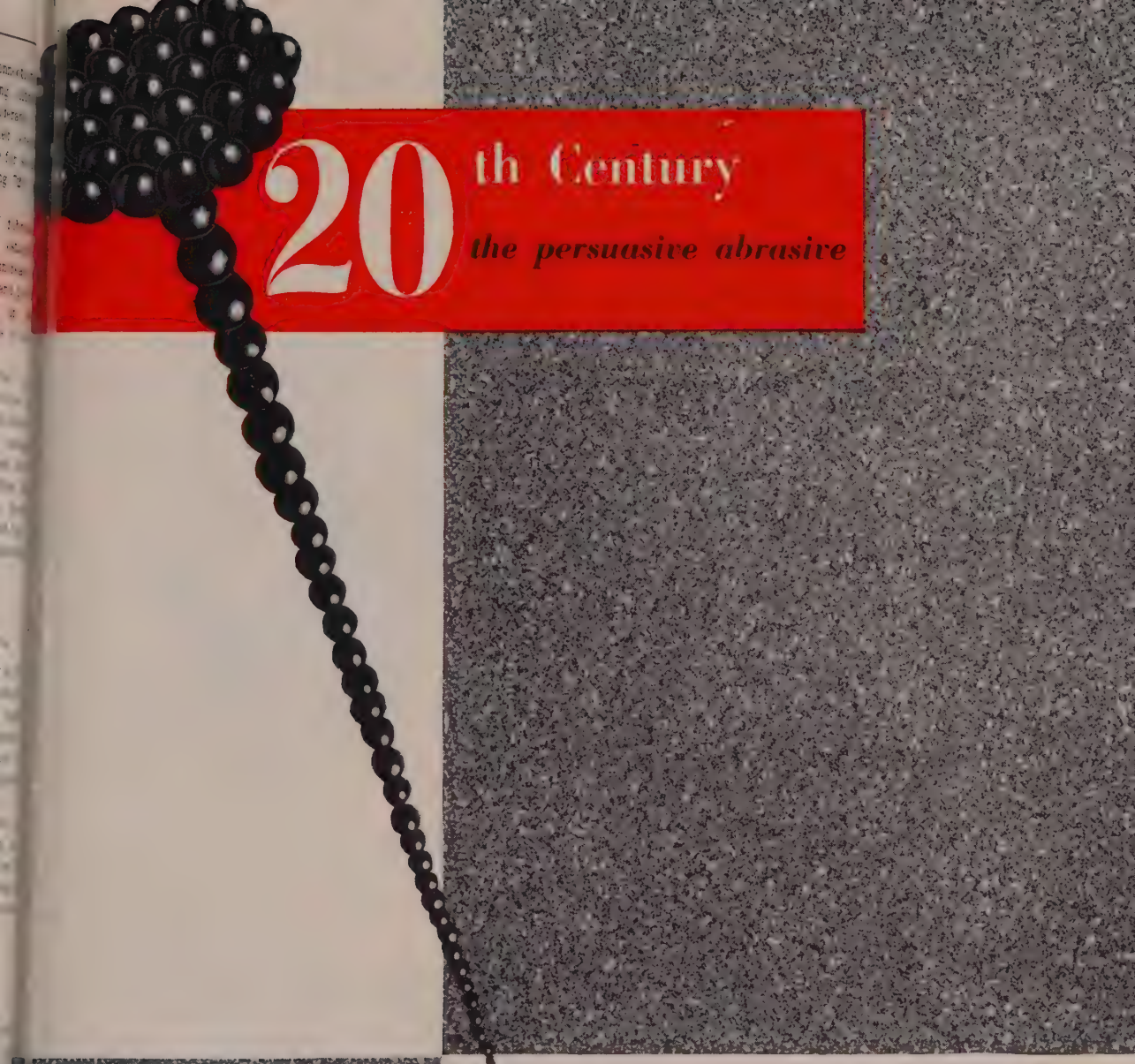
Structural plate pipe inquiry is up slightly, including 1600 feet, 60-inch. Railroads are releasing but a small part of tonnage booked.

New York—Plate business still lags, some producers looking for an even slower movement before an upturn sets in.

Philadelphia—Plate producers still are in position to take substantial additional tonnage for June rolling, as demand remains light. The Claymont, Del., producer has suspended operations on its 120-inch mill for three or four weeks for repairs.

Pittsburgh—Incoming plate orders continue at a lower rate than in first

(*Please turn to page* 181)



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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85% C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2%max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min carloads, 35c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c. 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton. 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump. bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump. bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.8c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.5c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, and 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

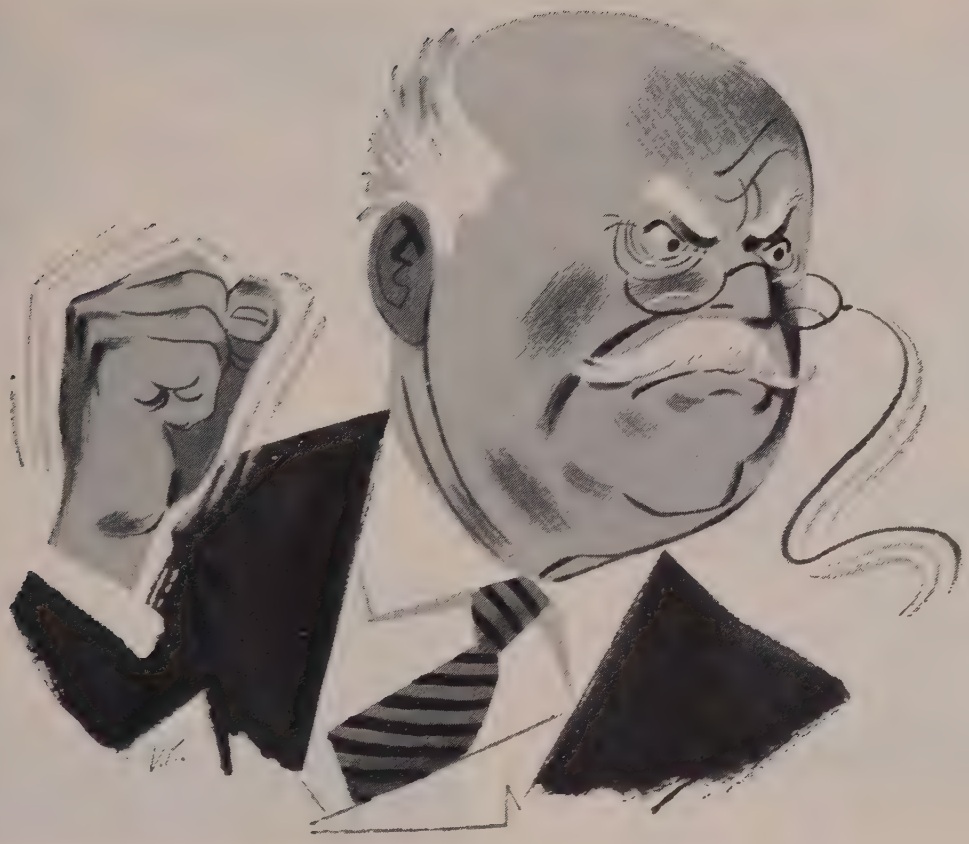
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6 per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.



FAMOUS LAST WORDS:

"they wouldn't dare"

That's what they said the day before Pearl Harbor. Remember? But by now you'd think people would have learned. Let's face it—we must be ready for disaster at any moment. It may be an atom bomb—or it may be a fire, a flood, a hurricane. It's only common sense to be prepared for it, whatever it is. Take these precautions TODAY:

- ☐ **Enlist the help** of your local Civil Defense Director.
- ☐ **Check contents** and locations of first-aid kits.
- ☐ **Send staff** to Red Cross courses. They may save your life.
- ☐ **Promote preparedness** in your community. Your local CD Director can show you how.

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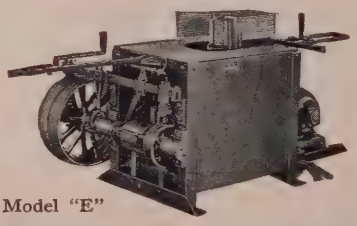
For Concrete Reinforcing Bars

This bender is the result of our 30 years experience in the manufacture of reinforcing bar benders. One man can easily bend 300 four bend stirrups an hour. This bender is also a very practical bender for light slab bars and miscellaneous bending. Write for catalog of our complete line of reinforcing bar benders.



Model "E"

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi range bessemer	$10.30
Mesabi range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake all freight rates, lake vessel freight rates, handling and unloading charges, and taxes therein which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic scheelite, mine	63.00

Manganese Ore

Min 48%, nearby, $1.02-$1.05 per long ton unit c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O. ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

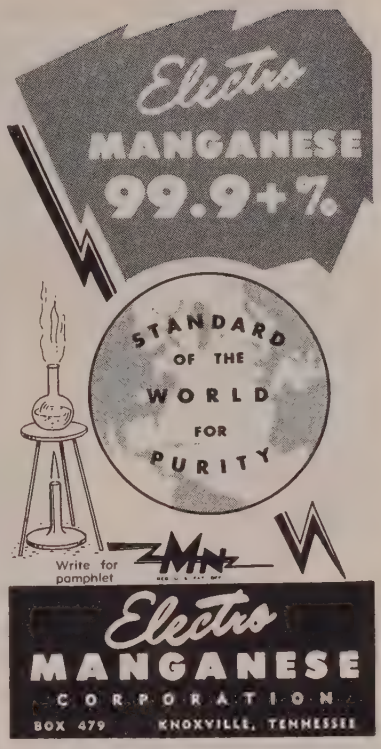
(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55



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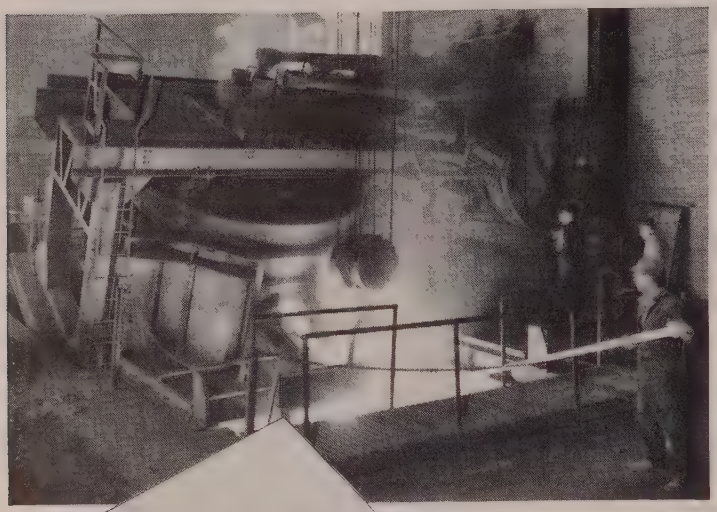

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* *On stainless side*

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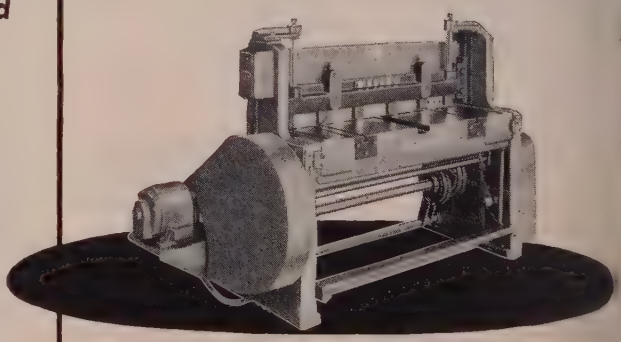

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(*Concluded from page* 174)

rter. Plate fabricators face heavy
pletition for business and are
tious not to place orders too
n with the resultant maintenance
ts.

Seattle—Demand for plates con-
ues fair but fabricators report big
jects are lacking.

emifinished Steel . . .

Semifinished Prices, Page 166

Youngstown—The Memorial Day
liday failed to result in any reduc-
n of steel production in this area.
ants operated normal schedules,
hough virtually every fabricating
op and other industrial activities
re closed to give employees a 3-
y holiday.

District steel rate last week rose
point to 69 per cent of capacity.

Los Angeles—To cushion an an-
cipated slab shortage resulting
om the proposed August shutdown
r overhauling of its blooming mill,
aiser Steel Corp., Fontana Works,
as boosted ingot production to 123.5
er cent of capacity.

teel Bars . . .

Bar Prices, Page 166

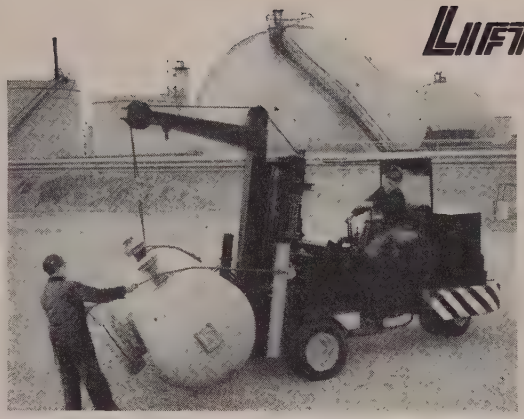
Cleveland—Not much change is
oted in demand for steel bars. Con-
umers continue to order largely
gainst needs. Expectations are buy-
ng may pick up as steel labor ne-
gotiations head into the final phase.

Boston—Most equalization in cold-finished bars meets converter prices within limited size range, 2-inch and under. Carbon bar orders are showing more life than alloy grades. Only in spots are most producers able to take on tonnage for June delivery. Average order is smaller and considerable tonnage coming to mills would normally be warehouse volume.

New York—While bar demand is well diversified, as usual, the general volume has shown no recent improvement. Trading in hot alloy bars appears to be particularly sluggish. On the other hand, and as an exception to the general situation in bars, cold-drawn material is moving well.

Philadelphia — Hot-rolled carbon bar business is a little better. Some of this improvement may be due to protective covering in the event of a steel strike and some to the possibility of a stepping up in the defense program.

Pittsburgh — Revival of the bar market will require a boost from defense orders and more warehouse purchasing. Military orders are being placed at a slow rate.



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With this versatile LIFT-O-KRANE you can do the impossible . . . Use it as a Crane Truck, a Fork Lift Truck and/or as a Ram Truck.*

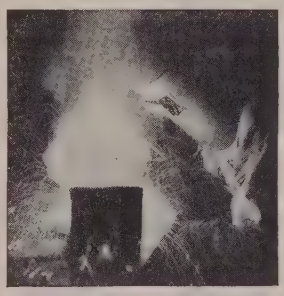
Silent Hoist heavy duty LIFT-O-KRANE is designed to make the most difficult job "all in the day's work." Take, for example, one of the 5 ton capacity LIFT-O-KRANES in daily duty at SUN OIL COMPANY, Marcus Hook (Pa.) Refinery. Here it is shown easily handling a bulky, unbalanced, heavy-to-handle accumulator tank. Its next job may be dragging lengths of pipe lines and locating them properly in ditches . . . then lifting and moving giant valves and heat exchangers and installing them in their proper place in the refinery lines. According to one Sun Oil executive, LIFT-O-KRANES lift and serve, day after day, with efficiency and dispatch, and *replace entirely any need for regular cranes.*

***3-IN-1 MACHINE:** With integrated BOOM Attachment—handle Hook Loads. With RAM Attachment—handle Hollow-Center Loads. With its FORK Tines—handle Timber, Machinery, etc.

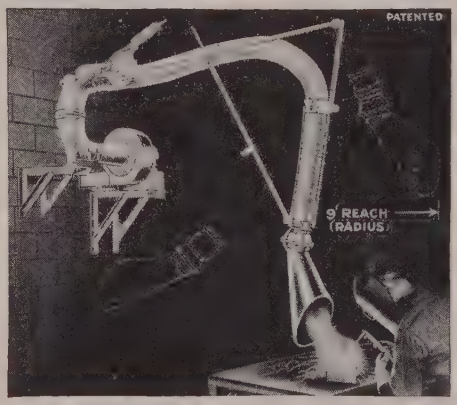
You, too, should investigate the tough, maintenance-free service of LIFT-O-KRANE Combination Machine . . . and LIFTRUK Heavy-Duty Fork Truck . . . in 5 - 7½ - 10 - 15 ton capacities. Send for Bulletin 77.

SILENT HOIST & CRANE CO.
Pioneers of Heavy Duty Materials Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

RUEMELIN Fume Collectors



Welding without ventilation. Note smoke and gas clouds.



(Right) Welding with Ruemelin Fume Collector.

REMOVE WELDING FUMES at the Source!

Ruemelin Fume Collectors remove smoke, gas and welding heat. Keep the shop air clean. Efficient and practical. Maximum coverage in welding areas. Your welders work better with this equipment in use. Write for bulletin 37-E describing the new spring-loaded counterbalance mechanism.

Long reach collector extends working range of hood to 15 ft. or 18 ft. operating radius. Double swivel permits hood to work in 360° circle for full coverage.

RUEMELIN MFG. CO.
Manufacturers and Engineers SAND BLAST AND DUST COLLECTING EQUIPMENT
3882 NORTH PALMER STREET • MILWAUKEE 12, WISCONSIN, U. S. A.

A 5896-½R

Wire . . .

Wire Prices, Page 168

Chicago—Merchant wire products are in sustained demand and sales for items in the manufacturers line are improving conservatively. Two wire producing plants in this area have called back to employment some furloughed workers.

Boston—Although wire mills will not be booked heavily this month, slight improvement in buying continues. Consumer inventories are down to a point where orders are more frequent for needed sizes.

Pittsburgh—Manufactures' wire inventories are being reduced gradually, causing a steady sales gain.

Tubular Goods . . .

Tubular Goods Prices, Page 169

Pittsburgh — National Tube Division announces in Gary, Ind., that it will install equipment for manufacture of plastic pipe. Installation will be located at the Gary Works and extrusion will start in September. Screw-type extruders will manufacture pipe from ½-in. to 6-in. National Tube has been experimenting with a pilot plant manufacturing plastic pipe since late 1952.

In steel tubular products, several producers of oil country goods say they are looking for third quarter orders. Prospects are that activity will be near capacity in seamless tube for oil country use through that quarter, but competition is already noticed in a lack of large volume third quarter orders. Freight absorption may be introduced soon.

Two new heat-treating furnaces for pipe annealing will be constructed for Jones & Laughlin Steel Corp. at its Aliquippa Works. They will be designed and constructed by Rust Furnace Co.

Boston — Merchant pipe distributors are placing mill orders on a replacement basis.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2100 tons, Edward F. Barrett power station, Long Island Lighting Co., Island Park, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

1575 tons, factory, International Business Machines Corp., Kingston, N. Y., through Turner Construction Co., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1100 tons, warehousing and shop buildings, airfield base, Portsmouth, N. H., to International Steel Co., Evansville, Ind.; Arthur Venneri Co., East Westfield, N. J., general contractor.

1070 tons, section, Cross Bronx expressway, New York, through Slattery Contracting Co., to Mt. Vernon Bridge Co., Mt. Vernon, O.

800 tons, Holy Cross school and faculty hou Bayside, Long Island, to Central Iron Wor Bronx, New York.

650 tons, Section 54-1, Cross Bronx expre way, New York, through Klevens Cor general contractor, to Harris Structural St Co., New York.

490 tons, including joists, industrial buildi Cabot, Cabot & Forbes, for Ferrington M Co., Needham, Mass., to West End Ir Works, Cambridge, Mass.; Vappi & Co. In Cambridge, general contractor.

435 tons, Washington state Chelan cour bridge, to American Bridge Division, U. Steel Corp., Portland, Oreg.; Paul Jar Inc., Seattle, general contractor, low $45(424.

425 tons, plant addition, Stokes Machine C Philadelphia, through Robert T. Lamb Son, general contractors, to Eastern St Structures, Easton, Pa.

250 tons, shopping center, Norristown, Pa., Belmont Iron Works, Eddystone, Pa.

250 tons, addition, Jewish Community Cente Teaneck, N. J., through Max M. Simo to Grand Iron Works, New York.

250 tons, packing plant, Swift & Co., Jackso Miss., to Mississippi Steel & Iron Co., Jack son; M. T. Reed Construction Co., Jackso general contractor.

220 tons, school, Lady of Angels, 112th Street New York, through John W. Ryan Con struction Co., to Bethlehem Fabricators Inc. Bethlehem, Pa.

220 tons, two bridges, Stamford, Conn., t Port Chester Iron Works, Port Chester N. Y.; Frederick Wensel Co., Stamford general contractor.

215 tons, factory, P. L. Andrews Inc., Hicks ville, N. Y., to Bethlehem Steel Co.

195 tons, office and warehouse for G. R. Kin ney Co., Shiremanstown, Pa., through Ritter Bros., Harrisburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, garage, Southern New England Telephone Co., West Hartford, Conn., to Topper & Griggs, Hartford; Industrial Construction Co., Hartford, general contractor.

NEW! TURBO BLAST
CLEANING MACHINES
for washing, degreasing, stripping

Turbo-Blast combines violent agitation with solution detergency to quickly remove chips, cutting oils and drawing compounds from parts in production. Also cleans grease, oil, carbon and deposits from parts and assemblies being serviced. Saves up to TWO-THIRDS in cleaning time. Saves on chemicals — plant space and labor. Heated with steam, fuel oil, natural or manufactured gas with thermostat control for efficiency and economy. Performance facts available.

Sizes for all requirements from small portable units to specially designed systems of any size, conveyorized or batch types.

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Send me Turbo-Blast Catalog.
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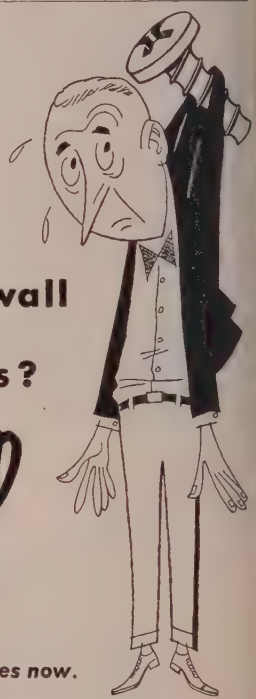

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Send for prices now.

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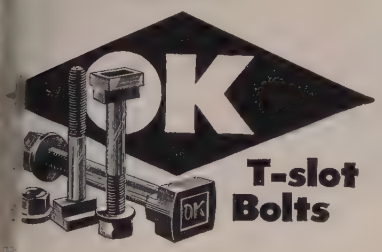
SCREW CORPORATION
Plant at W. Warwick, Rhode Island
BRASS, STEEL, AND STAINLESS

10[illegible] ons, factory, Fairmont Aluminum Prod- [illegible] Corp., Farmingdale, N. Y., to Cross [illegible] nd Construction Inc., Nassau county, [illegible] g Island, N. Y.
10[illegible] ons, Link-Belt Co., warehouse, Portland, [illegible] g., to Isaacson Iron Works, Seattle.
10[illegible] tons, mill building, Burlington Mills, [illegible] ttsboro, Ala., to Carolina Steel & Iron [illegible], Greensboro, N. C., and Virginia Steel [illegible], Birmingham; H. L. Coble Construction [illegible], Greensboro, N. C., general contractor.

STRUCTURAL STEEL PENDING

9[illegible] tons, bridge work, Pennsylvania railroad, [illegible] tsburgh, bids June 15.
5[illegible] tons, three-span continuous plate girder [illegible] d single span plate girder bridges, Water- [illegible] ry expressway, Waterbury, Conn.; bids, [illegible] rtford, June 7.
4[illegible] tons, state bridge, Wilmington, Del., Em- pire Construction Co., Baltimore, low on general contract.
370 tons, Army deep sea terminal, Whittier, Alaska, Manson-Osberg and Scheuman-Johnson, Seattle, joint low, $4,473,162.
250 tons, 5742 linear feet single lane, trestle-type steel bridges for Alaska roads; bids to Alaska Road Commission, Juneau, June 22.
200 tons, operations building, Ft. Mead, Maryland, bids June 18.
145 tons, Frankfort creek bridge, Philadelphia, Kaufman Construction Co., Philadelphia, low on general contract.
120 tons, miscellaneous shop work, Air Force base, Dover, Del., bids to be opened by Corps of Engineers, Philadelphia, June 18; this is in addition to other work previously noted.
120 tons, New York state office and shop building, Binghamton, N. Y.; bids closed
100 tons, laboratory, DuPont interests, Wilmington, Del., bids asked.



world's best . . . one-piece, drop forged—welded—of mild carbon steel, heat-treated, head accurately milled for standard tables, lathes, planers, boring mills, milling machines, integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36—$1.58; ⅞—$1.89. Write for price list

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LEWIS
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automatic, high-speed heavy-duty
WIRE STRAIGHTENING
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Sizes for .012" to ¾" WIRE
ROUNDS & SHAPES
THE LEWIS MACHINE CO.
3450 E. 76 ST., CLEVELAND, O.

REINFORCING BARS . . .

REINFORCING BARS PLACED

315 tons, Washington state, Lewis county bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Neukirck Bros., Seattle, general contractors.
160 tons, Washington state, Chelan county bridge, to Santa Fe Steel Co.; Paul Jarvis Inc., Seattle, general contractor.
100 tons, packing plant, Swift & Co., Jackson, Miss., to Contractors' Metal Co., Jackson; M. T. Reed Construction Co., Jackson, general contractor.

REINFORCING BARS PENDING

830 tons, Army deep sea terminal, Whittier, Alaska; bids in.
530 tons, foundation piers, eight bridges, Maine turnpike extension, Portland-Augusta, bids June 11; also erection of 1500 tons, fabricated structural steel, delivered Danville Junction, Me., contract 214.
355 tons, foundation piers, nine bridges, Maine turnpike extension, Portland-Augusta; bids June 11; also erection of 910 tons, fabricated structural steel, delivered Brunswick, Me.
230 tons, two plate girder bridges, Waterbury expressway, Waterbury, Conn.; bids, Hartford, June 7.

PLATES . . .

PLATES PLACED

450 tons, estimated, six steel oil barges; bids June 10, Corps of Engineers, Memphis.
320 tons, two welded lake barges, Warner Co., Philadelphia, through the Bethlehem Shipbuilding Division, to Bethlehem Steel Co., Bethlehem, Pa.
295 tons, tank work, Texas Co., Plattsburg, N. Y., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

1700 tons, Army deep sea terminal, Whittier, Alaska; bids in.
285 tons, two tanks, The Texas Co., Burlington, Vt., to Chicago Bridge & Iron Co., Chicago.

PIPE . . .

STEEL PIPE PLACED

950 tons, five miles, steel pipe, Columbia Gas Systems Inc., Baltimore, to National Tube Division, U. S. Steel Corp., Pittsburgh.

RAILS, CARS . . .

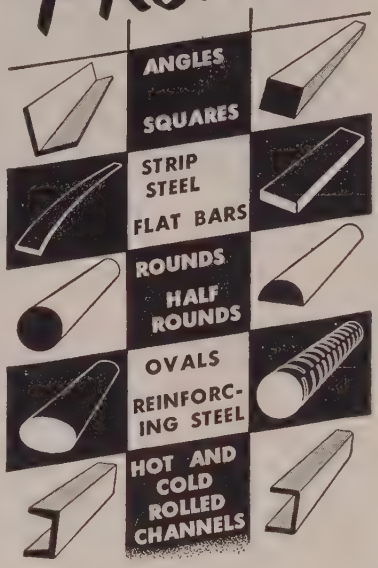
LOCOMOTIVES PLACED

Bangor & Aroostock, five 1750-hp road switching diesel units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.
Lake Superior & Ishpeming, one 1600-hp diesel unit, to American Locomotive Co., New York.
Union Pacific, four 1750-hp general purpose diesel units, to Electro-Motive Division, General Motors Corp., LaGrange, Ill.

RAILROAD CARS PLACED

Central of Georgia, 500 fifty-ft box cars, to Pullman Standard Car Mfg. Co., Chicago.
Transportation Materiel Commission, Marietta, Pa., 1390 freight cars, to Magor Car Corp., New York. List comprises 825 forty-ton box cars and 565 forty-ton gondolas.

STEEL.. PRONTO!



We're a handy West Coast specialty mill rolling standard merchant bars of mild steel. We're giving quick service [nation-wide] on small tonnage orders—standard shapes in small sizes.

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Small Tonnage—Small Sizes
AT LOW COST
Our tooling cost is only a fraction on small sizes compared to large tonnage mills

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STEEL ROLLING MILLS, INC.
1750 FOURTH AVENUE SOUTH
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THE GREATEST MULTI-PURPOSE

AIR HAMMER EVER MADE

THE APPTON SUPER 7 HAMMER

STARTS and STOPS Automatically!

a GIANT for POWER
a DWARF in SIZE

NO Recoil!
NO Servicing!
Economical to Use!

Patent Nos. 2,265,989—2,333,405—2,320,340.

NEW IMPACT CONTROL FEATURE

(from light tap to heavy blow)

The one hammer that does everything . . . drills! trims! chips! scales! seals! rivets! peens! smooths! weld breaks and cuts metal! . . . yet weighs less than 5 lbs. OVER 40 TOOLS for practically every type job.

Write for prices and literature.

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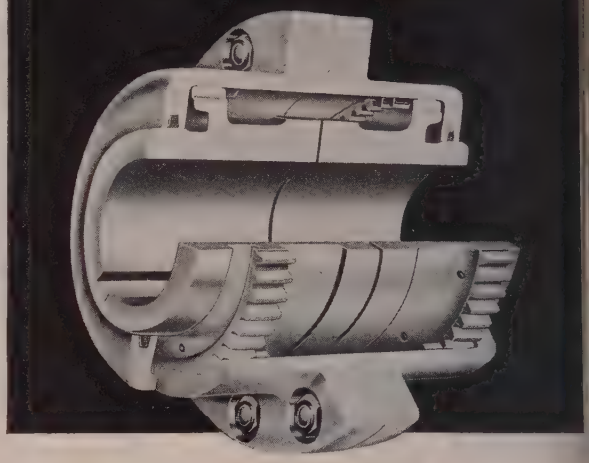

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POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

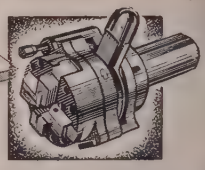
WHEELING
SOFTITE

Ductile, Tight-coated Galvanized Sheets...Commercial or Drawing Qualities in gauges no. 18 to 30

WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

WHEELING STEEL

H&C Insert Chaser DIE HEADS



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rap Market Loses Some of Its Punch

Uptrend in prices appears stalled at most consuming points with volume buying of steel grades absent. Labor negotiations and world political situation watched

Scrap Prices, Page 186

hicago — While lack of buying ds the scrap market in a quiet te some signs of strength continue sent. Several open-hearth grades nt up $1 per ton last week. A ple railroad items also advanced. is show of strength followed a riod early in the week when the rket appeared to be losing some the stronger tone in evidence over e recent past.

Philadelphia — Strength at some dwestern points isn't reflected in e local scrap market, at least sofar as buying volume is conrned, or prices. Actually, the only ange in prices is in machine shop rnings, which are up $1 to $14 dered.

New York—Trading in steel scrap spotty and brokers' buying prices e unchanged. However, the maret has a fairly strong undertone, e possibly in part to strength in e Midwest.

Cleveland—Activity in the scrap arket here remains quiet with prices olding unchanged. Local mills have ade no purchases recently. Foundes report slack business and some eport a decline in May compared ith April. They are maintaining crap stocks equivalent to about 40 ays' needs, slightly under normal n anticipation of lighter needs hrough the summer months.

Cincinnati—All open hearth grades f scrap moved up $1 per ton here. No. 1 grades are quoted $26 to $27, No. 2 heavy melting $23 to $24, and No. 2 bundles $20 to $21. Low phos declined $1 to $32 to $33. The higher prices are based on buying at Middletown, O., the nearest consuming market. Scrap is easy to buy at the prices quoted.

Boston—Steel scrap prices are holding fairly well on limited buying following a mild flurry several weeks back during which advances up to $2 per ton were general. Prices are not subjected to test, and district buying is flat. Light industrial scrap moves slowly with chemical borings holding at $11 to $12, shipping point. Foundries are buying in small lots as needed and most smaller shops are operating without any appreciable inventory. Heavy breakable cast is now $24 to $25. Yard stocks are on the high side.

Buffalo—While the scrap market generally is biding its time, limited buying interest is reported in machine shop turnings at price advances of 50 cents a ton. No. 1 heavy melting is supported by buying from the Valley.

Pittsburgh—Purchasing of scrap continues slow with only small-volume ordering reported. Under these conditions prices are leveling off and are generaly considered stable. No further rise is likely until production rates increase.

Birmingham — Posted prices on scrap have moved up slightly in this district, more as an inducement to bringing out material than as a reflection of current demand. Rerolling rails have gone up from a range of $34 to $35 to a new spread of $37 to $38. Some heavy melting steel moved recently at prices somewhat above the generally quoted market.

Los Angeles — Mill buying, depressed since start of the year, is limited almost exclusively to specialty grades of scrap. Some movement of electric furnace scrap is noted at $25.

Seattle—Scrap dealers think the market is resting on bottom. Supplies are ample, some items, such as bundles, being surplus. The upturn in eastern centers has not reached the Pacific Coast. This area's only foreign market, Japan, is unable to finance exports to any marked extent. Prices are unchanged.

San Francisco — The steel scrap market remains in the doldrums, but prices are unchanged and are expected to remain so through June.

Pig Iron . . .

Pig Iron Prices, Page 170

Philadelphia—Some of the larger consumers are taking in a little more pig iron. Whether this is a protective measure due to the worsening foreign situation or to the possibility of a strike, or both, is not known. In any event, this buying has come notwithstanding the fact that inventories were presumed to be in good shape on the basis of present operations.

Buffalo — Demand from building equipment sources is a leading factor in the merchant pig iron market.

(*Please turn to page* 188)

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

June 2	$28.50
May 26	28.17
May Avg.	28.00
June, 1953	40.50
June, 1949	20.85

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting..	30.00-31.00
No. 2 heavy melting..	28.00-29.00
No. 1 bundles	30.00-31.00
No. 2 bundles	26.00-27.00
No. 1 busheling	30.00-31.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals	30.00-31.00
Heavy turnings	27.00-28.00
Punchings & plate scrap	33.00-34.00
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	33.00-34.00
Heavy breakable cast..	31.00-32.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast..	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 2-ft and under	43.00-44.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths..	37.00-38.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids..	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	28.00-29.00
No. 2 heavy melting..	24.00-25.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Low phos.	26.00-27.00
Cut structural plate 2 ft and under	34.00-35.00
Alloy free, short shovel turnings	16.50-17.50
Electric furnace bundles	26.00-27.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	27.50-28.50
Stove plate	36.50-37.50
Heavy breakable cast..	26.50-27.50
Unstripped motor blocks	25.50-26.50
Brake shoes	30.50-31.50
Clean auto cast	43.00-44.00
No. 1 wheels	33.50-34.50
Burnt cast	31.50-32.50
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
R.R. malleable	41.00-42.00
Rails, 3-ft. and under	44.00-45.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	40.00-41.00
Cast steel	34.00-35.00
Railroad specialties	35.00-36.00
Uncut tires	36.00-37.00
Angles, splice bars	42.50-43.50
Rails, rerolling	42.00-43.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting..	29.00-30.00
No. 2 heavy melting..	24.00-25.00
No. 1 bundles	29.00-30.00
No. 2 bundles	22.00-23.00
Machine shop turnings.	13.00-14.00
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	30.00-31.00
Electric furnace bundles	29.00-30.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	23.00
No. 2 heavy melting...	21.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 1 busheling	23.00
Electric furnace bundles	25.00*
Machine shop turnings	*14.00*
Mixed borings, turnings	15.00
Short shovel turnings	17.00
Structurals & plate	29.00*
Heavy turnings	22.00
Couplers, springs, wheels	31.00
Rail crops, 2 ft & under	41.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	39.00
Heavy breakable cast..	35.50
Unstripped motor blocks	28.00*
Drop broken machinery	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	17.00-18.00
No. 2 heavy melting...	15.00-16.00
No. 1 bundles	17.00-18.00
No. 2 bundles	13.00-14.00
Machine shop turnings.	5.50-6.00
Mixed borings, short turnings	8.00-9.00
Low phos. (structural & plate)	21.00-22.00
Short shovel turnings ..	10.50-11.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings..	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	17.00
No. 2 heavy melting..	15.25-16.00
No. 1 bundles	17.00
No. 2 bundles	13.25-14.25
Machine shop turnings	3.00-3.50
Mixed borings, turnings	5.50-6.00
Short shovel turnings..	7.25-7.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	25.00-26.00
No. 2 bundles	*20.00-21.00*
No. 1 busheling	25.00-26.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	13.50-14.50
Short shovel turnings..	13.50-14.50
Cast iron borings	13.50-14.50
Low phos., 18-in.	32.00-33.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast..	36.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R., heavy melt.	29.00-30.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths..	37.00-38.00

CHICAGO

No. 1 heavy melting	*31.00-33.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 factory bundles	*33.00-34.00*
No. 1 dealer bundles	*31.00-32.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*31.00-33.00*
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals, 3-ft	*34.00-35.00*
Punchings & plate scrap	*34.00-35.00*
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	32.00-34.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	40.00-42.00
Drop broken machinery	41.00-42.00

Railroad Scrap

No. 1 R.R., heavy melt.	*34.00-35.00*
R.R. malleable	40.00-42.00
Rails, 2-ft. and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Angles, splice bars	38.00-39.00
Rails, rerolling	*43.00-45.00*

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	21.00
No. 2 heavy melting...	19.00
No. 1 bundles	23.00
No. 2 bundles	19.00
No. 1 busheling	21.50
Machine shop turnings.	10.00
Mixed borings, turnings	10.00
Short shovel turnings ..	11.50
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	26.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting..	21.00-22.00
No. 1 bundles	26.00-27.00
No. 2 bundles	19.00-20.00
No. 1 busheling	*26.00-27.00*
Machine shop turnings	14.00-15.00
Mixed borings, turnings	17.50-18.00
Short shovel turnings..	18.50-19.00
Cast iron borings	17.50-18.00
Low phos.	29.00-29.50

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths.	33.00-34.00
Rails, 3-ft and under..	40.00-41.00
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting..	19.00-20.00
No. 2 heavy melting..	22.00-23.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings..	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	25.00-26.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*43.00-44.00*
Charging box cast	28.00-29.00
Stove plate	*40.00-41.00*
Bar crops and plate	*29.00-30.00*
Structural, plate 2 ft.	*29.00-30.00*
Heavy structural cast..	28.00-29.00
Unstripped motor blocks.	*34.00-35.00*
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00
Rails, 18-in. and under	39.00-40.00
Rails, random lengths.	34.00-35.00
Rails, rerolling	*37.00-38.00*
Angles, splice bars	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	26.50
No. 2 heavy melting..	24.50
No. 1 bundles	26.50
No. 2 bundles	20.25
Machine shop turnings	12.00
Short shovel turnings.	14.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	29.00
Heavy breakable cast..	29.00
Unstripped motor blocks	27.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	33.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.50
Rails, 18-in. and under	41.00
Rails, random lengths..	38.00
Rails, rerolling	45.50
Uncut tires	32.50
Angles, splice bars	33.50

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting..	23.00
No. 2 heavy melting..	19.00
No. 1 bundles	21.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings.	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast..	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths..	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting..	20.00
No. 2 heavy melting..	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings..	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	41.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting..	20.00
No. 2 heavy melting..	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings	5.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting..	$22.00
No. 2 heavy melting..	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

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CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
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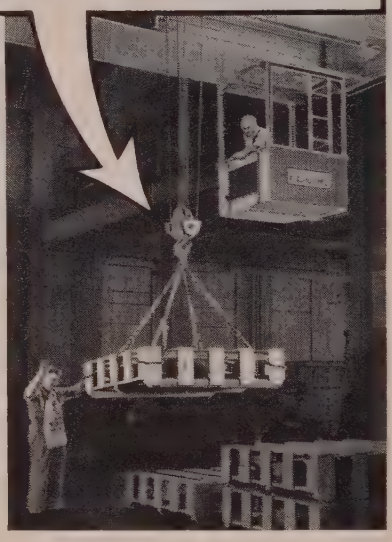

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Electric Hoists
Overhead
Traveling
Cranes

READING CRANES

(*Concluded from page* 185)

Motor and accessory casters are calling for substantial tonnages of iron but the market generally is spotty with many foundries operating well below capacity.

Chicago — Gray iron foundry operations in this area are expected to continue about as at present—somewhere in the neighborhood of 70 per cent of capacity—during the first three weeks of June. A number of shops will close for vacations the last week in June and first week in July.

Some buying of pig iron as a strike hedge is reported but the total isn't significant.

Of the district's 43 blast furnaces, 31 are active.

Rails, Cars . . .

Track Material Prices, Page 169

San Francisco — Western Pacific railroad is replacing the 75 lb rail on its 50-mile line from San Francisco to San Jose with 112 lb steel at a cost of $200.000.

Iron Ore . . .

Iron Ore Prices, Page 179

Cleveland—Shipments of iron ore from the upper lakes in the 1954 shipping season to date are more than 10 million tons behind the movement in the like period of 1953.

Season movement to date this year stands at 11,476,258 gross tons, according to the Lake Superior Iron Ore Association. This compares with 22,313,477 tons moved up to the end of May last year.

Ore shipments for the latest week, that ended May 31, totaled 2,443,-542 tons, slightly under the preceding week's movement, but 661,927 tons under that of the like week of 1953. In May shipments amounted to 9,951,556 tons, comparing with 13,596,829 in the same month last year.

Canada . . .

Toronto, Ont.—Production of primary iron and steel shapes in Canada in February amounted to 306,-705 net tons of which 94,755 tons were delivered under producers' interchange for further processing within producers' own plants. For the month immediately preceding production amounted to 358,676 tons including 106,012 tons for producers' interchange. In February 1953 output was 360,230 tons of which producers' interchange took 105,971 tons.

CLASSIFIED

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FOREMAN for job fabricating shop in northeastern Ohio, making small and medium size material handling and processing equipment. Must have experience in various alloys, supervision of men, new procedures, cost control. Old established growing firm offers excellent opportunity for advancement. State past experience, history, age, salary desired. Replies strictly confidential. Our men know of this ad. Address Box 974, STEEL, Penton Building, Cleveland 13, Ohio.

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PLANT MANAGER—M.I.T. Engineering Graduate with Proven Record in Supervision, Production, Tooling, Cost Reduction, Methods Improvement and Related Functions. Reply Box 949, STEEL, Penton Building, Cleveland 13, Ohio.

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M.E. Graduate, 18 years' experience contacting industrial accounts, distributors, including presentation of educational and sales clinics. Located Cleveland area, desires minimum travel. Age 39. Reply Box 972, STEEL, Penton Building, Cleveland 13, Ohio.

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SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N.Y.

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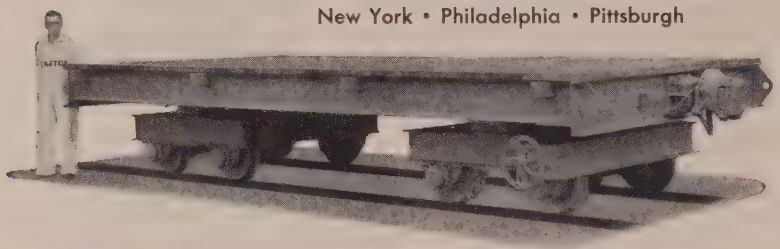

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by don herold

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It removes scale, rust, dirt and paint as easy as pie
-cleans bridges, tanks, buildings, hulls, structural metal, sheets and plates, like magic

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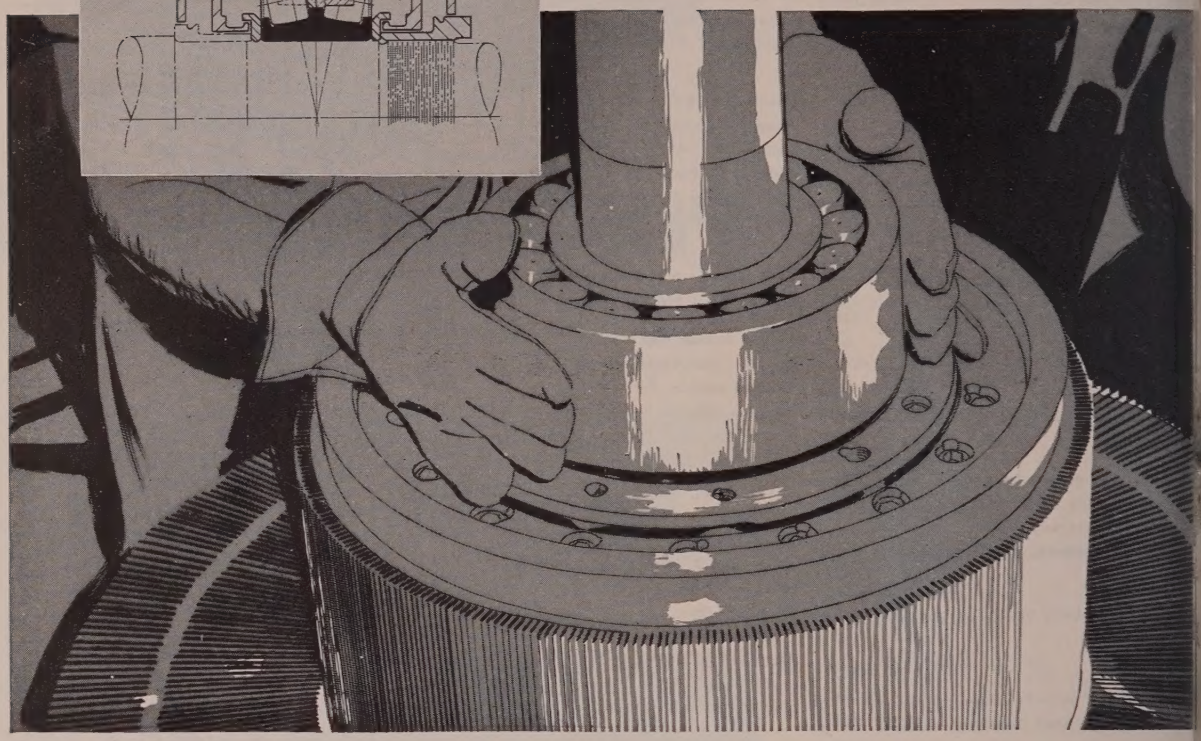
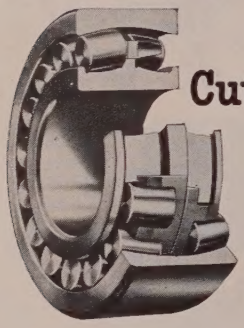


Precision-ground TORRINGTON Spherical Roller Bearings help cut friction on shaft of a General Electric direct current generator.



Cutting friction and costs throughout industry

Name your toughest, costliest bearing problem, TORRINGTON Bearings will solve it—just as they have solved scores of such problems in virtually every major industry.

Consider, for example, TORRINGTON Spherical Roller Bearings—and these big advantages.

Precision-ground contact surfaces—for even load distribution, maximum bearing life. *Accurate geometrical conformity between races and rollers*—for ultimate load carrying capacity. *Carefully heat-treated races and rollers*—for maximum resistance to shock and wear. *Bronze, machined cage for each path of rollers*—for freedom of operation. *Integral center flange on inner race*—for positive radial stability and positioning for thrust loads. And self-alignment—for smooth service under shock loads at maximum speeds.

TORRINGTON Spherical Roller Bearings are available from stock with either straight or tapered bore for shaft or adapter mountings. Prove to yourself that it pays to buy the finest—specify TORRINGTON.

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Roller

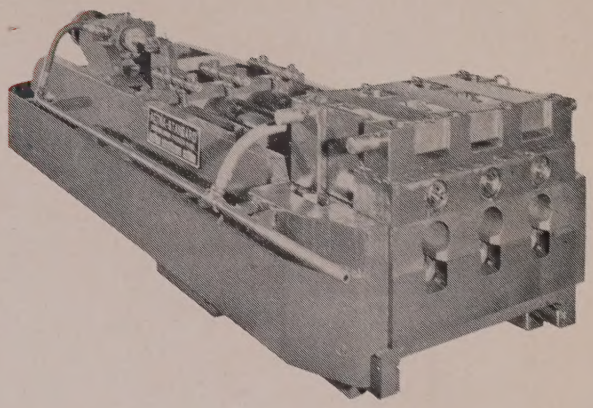
nnouncing . . .

NEW DRAWBENCH DEVELOPMENT

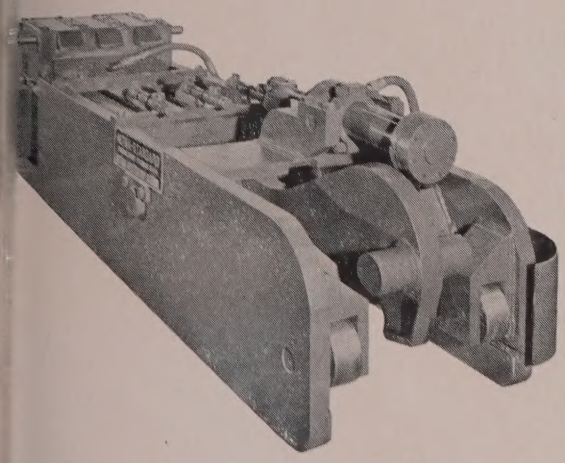
AIR

OPERATED CARRIAGES

AND HOOK



Says an Aetna drawbench customer—"Applying air to the carriages and hook is the greatest thing you have ever done for me."



tna has equipped ten benches with air-operated carriages and k. What about yours?

positive gripping . . .
positive hooking . . .

● Tubes can be drawn at least six inches before air pressure releases the gripping cylinders. This six-inch margin assures a positive grip on tubes. Another advantage — the use of air permits close-up gripping to die stand although the carriage action does not require actual contact with die stand.

Both the carriage and air hook cut down on breakage and maintenance because they eliminate the chief cause — slam-bang action. The cylinder lets the hook down gently and smoothly.

Air-operated carriages, which include many patented features, can be adapted to existing benches of any size. Aetna has interchangeable heads for Aetna's own benches or can adapt the new head to existing benches of other makes. The air-operated heads and hooks can be used for single, double, triple, four- or five-draw.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

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Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
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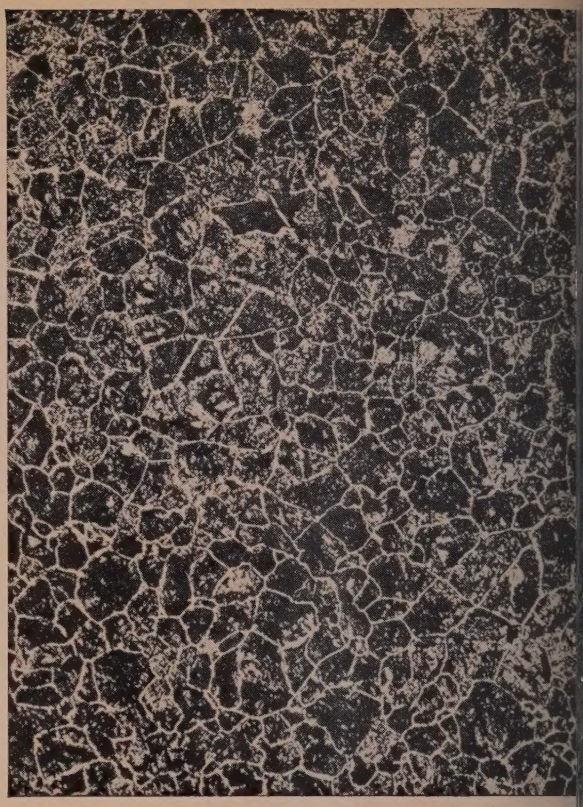
Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries



Meet two of the reasons why TIMKEN® forging steels give you uniform, high-quality forgings

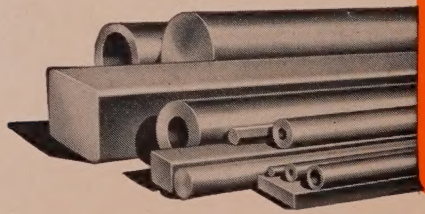
THE man on the left helps assure you of uniform composition in every Timken® steel forging bar. With this spectrometer, he can tell the exact composition of a melt in just 40 seconds. Results are flashed back to the furnace so the melter can maintain constant control of the heat analysis up to the instant of pouring.

The photomicrograph at right shows the uniform grain size of the Timken forging steels. Uniform grain size after heat treatment is assured by spectrometric or microscopic examination of every heat. The result—you can be sure that forgings made from Timken forging steels have uniformly high ductility and resistance to impact.

But that's only part of the story. You can hold rejects t a minimum because we condition the steel to fit your pa ticular forging requirements. And you save steel becaus the good dimensional tolerances of Timken forging stee produce uniform weight multiples with a minimum steel lost in flashings. You even have fewer furnace adjus ments because Timken forging steels respond uniform to heat treatment.

For help in improving the quality of your forgings an cutting production costs, write: The Timken Roller Bea ing Company, Steel and Tube Division, Canton 6, Ohi Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBIN